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ANNUAL REPORT
of the SECRETARY
OF THE INTERIOR

for the FISCAL YEAR ENDED 1934
JUNE 30

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30
1934



UNITED STATES
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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 30, 1934.

SIR: I have the honor to transmit my annual report for the Department of the Interior for the fiscal year ended June 30, 1934.

Very respectfully,

HAROLD L. ICKES,
Secretary.

The PRESIDENT,
The White House.

*THE REPORT OF
THE SECRETARY OF THE INTERIOR
TO THE PRESIDENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1934*

As in my first annual report, I will not attempt to interpret or give a resumé of the detailed reports of the various divisions, offices, and bureaus of the Department of the Interior contained herein.

Since my previous annual report there have been important changes in the organization of this Department. Among these was the transfer to this Department of the administration of the affairs of Puerto Rico. This was done by Executive order, the island having formerly been within the jurisdiction of the War Department. This transfer was subsequent to the period covered by this report, and since it was effected there has been organized in the Department the Division of Territories and Island Possessions. In this new Division are now grouped Alaska, Hawaii, the Virgin Islands, and Puerto Rico. The reports of the governors of the first three named will appear in separate form. Passage of the Taylor Grazing Act by the Congress necessitated setting up a new office in the Department, the Division of Grazing Control. This office did not operate for a sufficient length of time during the period here covered to justify inclusion of its early activities in this report.

As the President designated the Department of the Interior as the Federal agency responsible for certain administrative duties under the petroleum code, and as the Secretary of the Interior is the administrator under that code, the annual report of the Petroleum Administrative Board appears in this report.

Detailed reports of the many activities of this Department have been materially cut down in volume in this report for reasons of economy. Full particulars of the activities of any part of the Department are available in the files of the Department.

THE SOLICITOR

(NATHAN R. MARGOLD)

During the fiscal year ended June 30, 1934, for the first time, all of the more than 60 attorneys in the Department of the Interior, both in Washington and in the field, have been under the administrative jurisdiction of the Solicitor.

Centralization of responsibility and control has not resulted in loss of identity or any important change in the function of the legal sections attached to the several bureaus of the Department. It has seemed a requirement of organizational efficiency that so much of the business of each bureau as requires legal competency should be handled, in first instance, at least, by a legal staff assigned to that bureau and intimately and continuously associated with its work.

The central office of the Solicitor has continued to serve as the legal unit of the Office of the Secretary and as an agency for legal review of matters considered initially in the several bureaus of the Department.

The rendering of formal legal opinions for the Department is a growing and particularly important function of the Solicitor. The enactment of new legislation and the expansion of the activities of the Department have increased the number, the difficulty, and the importance of questions of law which must be decided for the guidance of departmental action. Among the 84 matters which have required formal opinion during the year are the following:

- The creation of grazing districts by Executive order;
- State taxation of Federal Subsistence Homesteads Corporation and its property;
- The conduct of soil-erosion projects on privately owned land;
- The pardoning power of the Governor of Alaska;
- Wages and hours of labor on Public Works projects in national parks; and

The extent of the police power of the Park Service with respect to private lands in national parks.

The more important opinions will appear in the forthcoming volume 84 of the Decisions of the Department.

More than 500 appeals from decisions of the General Land Office and related motions have been disposed of during the year. While many of the contentions of homesteaders, lessees, and other persons claiming under the land laws are covered by earlier departmental decisions, an effort has been made in the adjudication of each appeal

to make clear the rationale of decision. Useful direction is thus furnished for future administrative action and individual claimants are better satisfied.

A significant innovation and one which has produced gratifying results, has been the establishment of a legislative section within the Office of the Solicitor. Two specialists have devoted full time to legislative work with assistance from other attorneys in whose particular fields legislative problems have arisen. In 884 instances report has been made upon bills introduced in Congress. More than 50 appearances have been made before Congressional committees. The preparation and successful promotion of the Taylor grazing bill and the Wheeler-Howard Indian bill have been major achievements. The development and regulation of grazing districts on the public domain, as provided for in the Taylor bill, will be of great benefit to the livestock industry and through that industry to the entire Nation. The Wheeler-Howard bill is an important first step toward building upon a sound economic and political basis Indian communities which themselves will provide a means for the justification of further emancipation from the status of wardship. The members of Congress have already come to appreciate the service of our experts and to rely upon this staff for accurate and pertinent information both factual and legal. Building upon the groundwork laid during the last session of Congress the legislative section of this office can and will be of increasing usefulness during future sessions.

While the legal officers of the Department, both in Washington and in the field, have cooperated with the Department of Justice in the prosecution and defense of suits filed outside of the District of Columbia, the responsibility of the Solicitor for the representation of the Department before the courts has been limited to some 20 suits in the District of Columbia, wherein officers of the Department have been parties litigant in their official capacity. Individual cases have involved large money claims or large property interests, and occasional issues of general significance have been adjudicated.

Without further particular reference and in brief statistical resume the year's work of this office, exclusive of matters disposed of by the legal sections attached to particular bureaus, is summarized in the following table:

	Public-land matters		Indian matters	Miscellaneous matters
	Appeals	Motions		
Pending July 1, 1933.....	410	16	22	13
Received during year.....	462	58	8,885	12,447
Total.....	872	74	8,907	12,460
Disposed of during year.....	473	66	8,737	11,000
Pending June 30, 1934.....	399	8	170	1,460

¹ The number of miscellaneous matters pending on June 30, 1934, was large because about 750 oil- and gas-permit applications were held suspended pending consideration of a change of policy.

Miscellaneous matters" include the following:

Annual opinions by the Solicitor.....	84
Reports on legislation.....	884
Contracts for the erection of buildings, road construction and repairs, supplies, etc.....	2,286
Cases prepared for submission to the board of equitable adjudication....	682
Oil and gas matters:	
Leases.....	37
Prospecting permits:	
Granted.....	907
Reinstated.....	9
Assignments.....	153
Extensions of time.....	1,443
Canceled.....	231
Other matters:	
Prospecting permits.....	58
Licenses.....	26
Leases.....	31
Plumbers matters: Prospecting permits.....	14
Sodium matters: Prospecting permits.....	19
Sulphur matters: Prospecting permits.....	22

Outside of the central office, the development of reclamation projects and Indian irrigation projects under Public Works allotments has involved the acquiring of land, rights-of-way and miscellaneous licenses for new projects, contracting for construction, organizing water users and obligating them under appropriate repayment contracts. Moreover, it has been necessary to take cognizance of the water laws of the several Western States and the interrelation of Federal and State law in the planning and development of local and interstate projects. The detail of contracting for expenditures on projects and for repayment by water users has been particularly important because of the large sums involved. The legal safeguarding of the interests of the Government in transactions involving hundreds of millions of dollars has been a responsibility of this office. In one of the six reclamation districts alone 1,133 contracts involving \$24,944,966.68 have been executed.

The administration of estates of deceased Indians is an important legal service performed partly in the field and partly in Washington. The courts have no jurisdiction over Indian estates, except among the Five Civilized Tribes and the Osages in Oklahoma. Substantive problems of marriage and adoption according to Indian customs are being made a subject of revised regulation; the procedure for filing and allowing claims against Indian estates is being improved; causes of delay in the administration of estates are being removed wherever possible and a proper basis for the allowance of fees to private attorneys is being determined. No effort is being spared to make the Federal system of administration of Indian estates a model of efficiency for its intended purposes.

The organization and conduct of subsistence homestead enterprises authorized under section 208 of the National Industrial Recovery Act has presented important and difficult legal problems. The brief general provisions of section 208 have required frequent interpretation. The conduct of the enterprise under Federal statutes and administrative practice with reference to the acquisition of property, the letting of contracts and the conduct of operations generally, adopted in the light of traditional functions of the Government, has not been simple. In fact, it is difficult to imagine a more thorough test of the adaptability of the machinery of Government under existing law than the subsistence-homestead venture has presented. Moreover, the conduct of these federally sponsored and controlled projects in the several States has involved significant problems of Federal and State jurisdiction.

DIVISION OF INVESTIGATIONS

(LOUIS R. GLAVIS, Director)

The appropriation for the General Land Office for the fiscal year 1934 was \$400,000. Of this sum \$60,000 was to be used for prevention and suppression of forest and other fires on the public lands, and for no other purpose, leaving the net sum of \$340,000 for the prosecution of routine work, but due to the President's limitation of cash withdrawals only \$300,000 was available for this service.

The average number of active field investigators, exclusive of 4 special agents in charge, was 72; average number of clerks employed in divisional offices, 20; total force employed, including special agents in charge, 96, exclusive of the Washington office.

Due to the activities of field investigators, \$70,794.28 was collected and turned into the Treasury and 216,757 acres were restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

Investigations.—On July 1, 1933, there were pending field investigation 11,552 cases. During the year 11,150 additional cases were received; 14,226 cases investigated, reported and closed, leaving 8,476 pending investigation, which is a material reduction in the number of routine cases. Of the reports submitted, 3,133 were adverse and 10,195 favorable, and in addition reports submitted showing 898 cases closed without field investigation.

On the recommendation of this Department civil suits were brought by the Department of Justice. Twenty-three cases were tried, of which 18 were won and 5 lost. As a result of the suits \$47,147.12 were recovered and 560 acres restored to the public domain. Offences against the public land laws were responsible for seven indictments. Of the criminal cases tried 6 resulted in conviction and prison sentence was imposed in 4 cases. Fines were paid in the sum of \$3,800.

Attorneys and agents.—The number admitted to practice before the Department for the year ending June 30, 1934, was 25.

The appropriation for Protecting public lands, timber, etc., 1934, included \$60,000 for prevention and suppression of forest and other fires on public lands, to be available for this and no other purpose. No expense was incurred under this appropriation.

There were also investigated and closed in this Division the following cases: Homestead entries, 1; coal trespass, 1; fire trespass, 2; timber trespass, 7; official conduct, 2; unlawful inclosure, 19; criminal, 17; conspiracy, 19; miscellaneous, 37.

The Division investigated and closed 1 miscellaneous case for the Office of Education, and 1 official conduct and 2 miscellaneous cases for the Geological Survey.

The cases investigated and closed for the Office of Indian Affairs were: Official conduct, 30; criminal, 11; miscellaneous, 56.

The cases investigated and closed for the National Park Service included: Official conduct, 3; miscellaneous, 2.

The cases investigated and closed for the Bureau of Reclamation involved: Appraisal of lands, 1; official conduct, 4; miscellaneous, 5.

There were also investigated and closed 13 miscellaneous cases.

FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

Organization.—The investigational work for the Public Works Administration was assigned to the Director of Investigations for the purpose of having the benefit of the services of an enlarged trained personnel without the expense of setting up an entirely new additional office force.

Personnel.—The number of employees, including Washington office, was: 9 special agents in charge; 1 acting special agent in charge; 130 special agents and 74 other employees.

Nature of cases.—The cases investigated, relating to the expenditure of Public Works funds, consisted of collusive or fraudulent bidding involving contractors and subcontractors; wage rates and disputes; labor and materials; code violations; underpayment of wages to employees; repayment to contractors of wages of employees; contracts relating to housing projects; and misconduct of officers and employees of the Public Works Administration, National Reemployment Service and other governmental agencies, allotted Public Works Administration funds. The investigations concerned the expenditure of large sums of money and the disclosure of facts resulted in a substantial saving to the Government.

Investigations.—During the year 3,536 cases were investigated and reported. Of this number, 2,389 cases were reported adversely and 1,747 cases were reported favorably.

Court action.—On recommendation of the administrator, 119 cases were criminal prosecutions, resulting in 34 cases receiving court action; 17 cases resulted in indictments; and prison sentences were imposed in 3 cases.

CIVIL WORKS ADMINISTRATION

Organization.—Both for efficiency and economy, under the immediate supervision of the Public Works Administrator, and because Public Works Administration funds were allotted to the Federal

Brief Administrator for civil relief, the investigations of irregularities in expenditure of such funds were conducted temporarily by the Director of Investigations.

Investigations.—The cases investigated embraced a total of 417, of which 234 cases were favorably reported and 183 were adversely reported. There were 38 cases pending with the United States Attorney for prosecution; 12 indictments were secured; 9 cases reached in court action; 3 cases involved prison sentences and in 1 case sentence was suspended.

A number of important investigations relating to other emergency bureaus, were, by request, made by the Division of Investigations.

OIL ENFORCEMENT

Organization.—The Secretary of the Interior, in his capacity of Oil Administrator, by virtue of authority of Executive orders of July 11 and 14, 1933, designated the Director of Investigations to conduct all investigations in the enforcement of the provisions of the regulations under 9c of the National Recovery Act, and the provisions of the Code of Fair Competition for the Petroleum Industry.

"Hot-oil" cases.—The establishment of two offices of the Department in the vicinity of oil flush pools in Texas and Oklahoma, with a personnel of 1 acting special agent in charge, 36 special agents, and 4 clerks, was designed to prevent the transportation of oil produced in excess of proration orders of the States. A large number of cases was investigated; 320 cases are now pending; 59 cases are also pending in office of United States Commissioner awaiting action; 3 cases are before the United States Supreme Court for decision; 17 cases were dismissed by court order; 5 cases were reviewed by the Supreme Court of the State of Texas and 1 case resulted in conviction.

Tax evasions.—The Director of Investigations, under the immediate supervision of the Secretary of the Interior, by means of a marine unit, consisting of eight employees, operates a number of picket boats to investigate incoming tanker cargoes of petroleum and petroleum products to determine their origin. The information obtained forms an important aid in the enforcement of the regulations under 9c of the National Industrial Recovery Act, as well as being of valuable assistance to the States and the United States in the collection of taxes due and collectible on the petroleum products in transit to their actual destinations. Reports received from tax officials of several States indicate their appreciation of the cooperation given by this Department.

Oil code.—The personnel of the Division of Investigations for the enforcement of the oil code consisted of 10 special agents in charge, 7 acting special agents in charge, 97 special agents, and 55 other

employees, inclusive of the personnel at Washington. The cases investigated include a total of 7,263, of which 5,686 cases were reported on and closed. Of the total number of cases investigated, 252 were recommended for prosecution by the Secretary of the Interior; 133 cases of this number were authorized for prosecution by the Attorney General; and 21 cases are involved in court actions.

WAR MINERALS RELIEF COMMISSION

(ROSCOE FERTICH, Commissioner)

The War Minerals Relief Act, section 5 of the act of March 2, 1919 (40 Stat. 1292), as amended February 13, 1929 (45 Stat. 1166), authorized claimants to petition the Supreme Court of the District of Columbia for review of the decisions of the Secretary of the Interior upon questions of law, but provided that "the decision of the Secretary of the Interior on all questions of fact shall be conclusive and not subject to review by any court."

The Secretary of the Interior, acting under a decree of the Supreme Court of the District of Columbia in each instance, made 25 awards, 3 disallowances, 1 additional award under amendment, and 1 award on rehearing of a former denial, during the fiscal year ending June 30, 1934. These awards were certified to the General Accounting Office and were paid through the Treasury Deficiency Appropriations bill (Public No. 412, 73d Cong., 2d sess.) in the amount of \$589,231.13.

Record of cases filed under the act as amended Feb. 13, 1929

Total cases filed.....		348
Total cases dismissed by court on hearing.....	4	
Total cases dismissed for duplication of petitions.....	10	
	—————	14
Decisions by Secretary of Interior:		
To Mar. 4, 1933.....	107	
Mar. 4 to June 30, 1934.....	4	
July 1, 1933, to June 30, 1934.....	28	
	—————	139
Cases pending:		
In Supreme Court of District of Columbia.....	154	
In United States Court of Appeals, District of Columbia.....	1	
	—————	155
Decrees by Supreme Court of District of Columbia, pending in War Minerals Relief Commission on June 30, 1934.....		40

COURT DECISIONS

During the present fiscal year the Supreme Court of the United States sustained the opinion of the Secretary of the Interior that separate operations by a single claimant should be considered as one under the War Minerals Relief Act.

The United States Court of Appeals for the District of Columbia, in the Cuyuna Mining & Investment Co. case, sustained an opinion by the Supreme Court of the District of Columbia which held the

benefits accruing under the War Minerals Relief Act were gratuitous and not legal claims against the Government. The motion for review of this decision is now pending in the Supreme Court of the United States. The decision by the Supreme Court of the United States will have a direct bearing upon a great many of the pending cases.

The United States Court of Appeals for the District of Columbia sustained the opinion of the Secretary of the Interior that expenses incident to incorporation, stock sales and commissions, and discounts on securities were not, as matter of law, allowable items under the act. Time limit for motion for review of this decision by the Supreme Court of the United States has not expired.

PETROLEUM ADMINISTRATIVE BOARD

(NATHAN R. MARGOLD, Chairman)

SUMMARY

By Executive Order No. 6204 the President designated the Secretary of the Interior to administer section 9 (c) of the National Industrial Recovery Act and to enforce Executive Order No. 6199 prohibiting the shipment in or affecting interstate commerce of oil produced in violation of State law. By Executive Order No. 6260-A the President further expanded the powers of the Secretary of the Interior with respect to the petroleum industry by designating him Administrator of the Code of Fair Competition for the Petroleum Industry. He further empowered the Department of the Interior to act as Federal agency as provided for in the code. Section 2, subsection (b) of title I of the National Industrial Recovery Act empowers the President to create agencies necessary to carry out the policy of the act. The Petroleum Administrative Board is an agency created by the Administrator on behalf of the President to make effective provisions of the act so far as it applies to the petroleum industry. Its duties may be briefly summarized as assisting, advising and representing the Administrator with respect to matters incident to the administration of the Petroleum Code and to the enforcement of the regulations issued by the Secretary of the Interior under section 9 (c) of the act and the President's orders authorized thereby.

Throughout the life of the code representatives of the petroleum industry have constantly urged upon the Administrator various actions designed to obtain for the industry benefits intended to be conferred upon it by the National Industrial Recovery Act. Changes in the code have been proposed in order to make it a more effective instrument in the stabilization of the industry. Agreements have been submitted pursuant to title I, section 4, subsection (a) of the act. Studies have been commenced both by the industry and by the Board with a view to ascertaining the effect of the code and the act upon various units within the industry and with the further purpose of obtaining a picture of the economic processes of producing, refining, and distributing petroleum and its products, so that a basis may be laid for such further action as may seem advisable.

In dealing with any and all of these problems the Board has served a dual function. First, as a court of review to which complainants against particular rules or proposals may present their case, and secondly, as an advisory body charged with the duty of presenting to

the Administrator recommendations upon each specific proposal, based upon impartial technical and legal considerations.

Since the code includes within itself a broad sweep of the industrial and business processes surrounding the production and marketing of crude petroleum, it was inevitable that in the drafting there were some omissions of the essential provisions, inconsistent and conflicting provisions, and provisions which required modification and relaxation.

In the first year of the code, as the industry gained experience in its operation, it has been found necessary from time to time, after due investigation and hearing, to modify and to amend provisions of the code. With a few possible exceptions, depending upon future course of events, this process is now over. By this process of amendment, modification, interpretation, and regulation the code has taken on a well-rounded form, and with but slight changes hereafter should govern the industry for the duration of the National Industrial Recovery Act.

The Board has been requested to consider many plans directed toward stabilization of the petroleum industry. These plans generally aim at the attainment of a normal price level for petroleum and its products either nationally or in local areas. Their purpose has been to supplement the code so that the industry may be more readily able to bear the burdens imposed upon it by the act. Proposals have been many and varied, and have ranged from outright price fixing by governmental fiat to local agreements providing for the shutting off of supplies from violators either of the code or of local price agreements.

Section 6, subsection (a) of article III of the code, as modified on September 13, 1933, provides for the establishment of minimum prices based on cost recovery. Early in September 1933, the Planning and Coordination Committee submitted to the Administrator a comprehensive schedule of minimum prices for petroleum and its products from the well to the filling station. The board, in a report to the Administrator, pointed out that this schedule presented numerous technical and legal difficulties, and that the evidence used in supporting it was insufficient to justify the price levels proposed. The Board further recommended that due notice be given and a public hearing be held at which protestants against the proposed schedule might make their objections known. On November 20, the Planning and Coordination Committee requested the postponement of the effective date of the schedules until some later date so that due consideration might be paid to alternative proposals submitted by certain interests within the industry opposed to the schedules in principle, and to certain of its items in detail. By an order dated January 31, 1934, the price-fixing program was indefinitely canceled.

On December 7, 1933, the Planning and Coordination Committee submitted on behalf of itself and of various companies among the industry two complementary agreements, the National Purchasing Agreement and the National Marketing Agreement. They were designed to stabilize refinery, wholesale, and retail prices of gasoline, and assure protection to the small semi-integrated or nonintegrated refiners, and to the various types of distributors.

When these agreements were submitted to the Administrator they were released to the trade journals, trade associations, and to the press. Copies were sent to all parties who had recorded an opinion upon the price-fixing order for which the agreements were designed as a substitute. In accordance with the provisions of the National Industrial Recovery Act that "Nothing * * * shall deprive such persons of the right to be heard", hearings, conferences, and discussions were held on behalf of and with each protestant and commentor who desired to be heard.

After a thorough investigation of the agreements and the protests made regarding them, the Board prepared a memorandum setting forth certain conditions which it believed necessary to protect the interests of independent refiners and distributors, and to enable the agreements to comply with the requirements of the act that the order should not tend toward monopoly or operate to discriminate against small enterprise. These conditions were designed mainly toward strengthening the provisions concerning the elimination of lease and agency, lease and license agreements, and exclusive dealing contracts, toward providing for flexible administration of the provisions relating to margins and modification of the resale price-maintenance provisions, and to make possible the allowance of differentials to marketers who required such preferential treatment in order to remain in business.

The industry embodied the conditions to the Marketing Agreement within the redraft of the agreement and resubmitted it to the refiners for signature. Meanwhile, in March the agreements were submitted to the Department of Justice for analysis and approval. On June 27 the Attorney General notified the Administrator that the Department of Justice did not approve the agreements because they disagreed with the theory of notice and hearing under which they were promulgated.

Meanwhile, conditions in the petroleum industry have changed in many ways for the worse. In many areas the price structure is more chaotic than it has been for several years. Many companies, no longer willing to guarantee margins for retailers under such conditions, have withdrawn from participation in the agreements. Consequently, in all probability the agreements are now, after the delay, a dead letter.

Because of peculiar competitive conditions on the Pacific coast, disastrous price wars have raged throughout that territory. In an attempt to rationalize the industry by coping with the problem of over-capacity, the California industry proposed a cartel which assured all refiners an adequate supply of crude, a fair share of the gasoline market based upon their historical and current record of sales, and provided adequate margins and stabilized prices for the retail trade.

The Department of Justice, as a condition of the approval by the court of the agreement, insisted upon conditions which the industry found itself unable to assume. Immediately negotiations by the industry were begun to draft a new agreement which would be satisfactory to the Department of Justice, spurred on by a complete collapse of the price structure on the Pacific coast, involving a loss of millions of dollars, and ascribed by the industry to the failure of the cartel. As in other cases, this action was given wide publicity by the trade journals and newspapers and through trade associations. All refiners in the territory involved were contacted and all but one signed a new marketing agreement, which was submitted to the Administrator for approval.

When the agreement was submitted to the Administrator and the Department of Justice for consideration, notice was given by widespread publicity in the trade journals and newspapers throughout the Pacific coast and through trade associations. Such complaints and protests as were filed were duly considered. The Department of Justice, after a prolonged consideration, was willing to permit the agreement to become operative under the consent decree, provided the participants entered into a supplemental agreement, agreeing to abide by the provisions of the code and not to engage in monopolistic practices. The supplemental agreement was duly prepared and signed, and the Pacific Coast Petroleum Agency Agreement became effective June 23, 1934.

Under it an agency has been set up to take over distress supplies from small refiners. Prices have been stabilized, refiners have been afforded adequate crude supplies and a fair share of the market calculated from their past sales records and their current performance. Under the provisions of the agreement there is no price differential between the major and the affiliated companies and independent companies are selling their gasoline at the same price as the major and affiliated companies' third-grade gasoline.

The agreement provides for a representative of the Administrator, at present an attorney for this Board, to assist the executive committee of the refiners and the agency in the determination of problems arising under the agreement. At the suggestion of the Department of Justice, there is also to be organized a public committee of three to hear such complaints as may arise in connection with its

operation. It is believed that the market in California will be stabilized through the operation of this agreement, and that adequate administrative safeguards have been provided to prevent discrimination against any small enterprise.

Following upon the virtual failure of the national-purchasing agreement and the national-marketing agreement, proposals were made for the purchase by individual buyers of distress gasoline to meet temporarily the problems of excess crude production, and to bring about some adjustment between the wholesale price of gasoline and the price of crude petroleum. The disproportion existing between these prices has proven to be one of the major elements of instability in the marketing structure, and has been caused in large part by the presence upon the market of gasoline manufactured by small refiners located in and around the East Texas field from illegally produced crude petroleum. This gasoline has operated as a depressing factor upon an already abnormal market. Certain companies within the industry desired to purchase such gasoline in order to permit of its orderly liquidation, but did not wish to do so until they could be assured first that no gasoline would be produced in the future from illegally produced crude oil, and secondly, that such gasoline as was purchased would be cleared from the taint of illegality in the interests of conservation and stabilization. The Administrator on June 23, 1934, approved a form of contract to be used by such buyers, drafted after conferences between the Planning and Coordination Committee and the Petroleum Administrative Board. It is expected that this form, when generally used, will afford at least partial relief to what is at present a very distressing situation.

For a number of years the Petroleum Economics Division of the Bureau of Mines has assembled, analyzed, and published statistics on crude-oil production and stocks, as well as the production stocks and indicated demand for motor fuel and other petroleum products. The new reports which have been inaugurated under the administration of the Petroleum Code are a weekly report of crude petroleum stocks held by companies holding 100,000 barrels or more, a monthly report showing the interregional movements of crude petroleum, as well as the distribution of shipments by pipe lines, tankers, tank cars, and trucks, and a new natural-gasoline report showing interstate movements and classes of utilization. The weekly crude-oil stocks report and the monthly report on interregional movements of crude petroleum are published separately by the Petroleum Administrative Board.

The basis of the Petroleum Code is article III, providing means for the control of production. Section 3 of this article provides that the production of crude oil must be balanced by consumer

demand for petroleum products. Under the terms of the code and President's Executive Order No. 6260-A, the Petroleum Administrative Board, as Federal agency, estimates at intervals the required production of crude oil and allocates it equitably among the several States, due account being taken of expected withdrawals from storage and of anticipated imports. The required production so estimated has been allocated equitably to the several States, and upon approval by the Administrator, has been certified to the several States as the net reasonable market demand for crude petroleum therefrom.

The subdivision into pool, lease, and/or well quotas is made within the State. In the States of Texas, Oklahoma, and Kansas, each of which is provided by State law with a regulatory commission, the approved allocations have been certified with the Texas Railroad Commission, the Oklahoma Corporation Commission, and the Kansas Corporation Commission, as the net reasonable market demand for the crude petroleum in those States. These estimates have afforded the basis upon which allocations have later been made to individual operators of the production which they are permitted to utilize pursuant to law. The State of Montana, by an act of its legislature approved on December 29, 1933, an oil-conservation board to be established to have general control, regulation, and supervision of the production, transportation, and storage of crude petroleum within that State. Similar legislation is expected to be enacted in the State of Louisiana.

In the making of production allocations, a continuous effort has been made to provide a proper balance in refining operations and as nearly a uniform rate of operation throughout the seasons as possible. The allocation among the several States has been based principally upon the customary and established channels of trade for the movement of crude petroleum and petroleum products between producing and consuming regions. Special studies also have been made relative to the demand for crude petroleum from newly developed producing areas.

In general, the effect on crude-oil production of operations under the Petroleum Code during the 10 months ended with June 30, 1934, has been a more equitable distribution of output among the several States than was possible of achievement under conditions which existed prior to the effective date of the Petroleum Code.

The statistical position of the refining branch of the industry was essentially unbalanced, and it became evident that a lack of normal relationship between refinery gasoline prices and field prices for crude petroleum was rendering impossible the profitable operation of petroleum refineries, particularly the nonintegrated and semi-integrated.

ated refineries which buy all or a major portion of their crude petroleum supplies at the posted field prices.

The Board, therefore, recommended to the Administrator certain provisions designed to control the operations of refineries, both with respect to stocks on hand and production of gasoline. An amendment to the code was thereupon submitted to the industry, a public hearing was held, and after conferences subsequent thereto, an amended article IV was submitted to the Petroleum Administrator, which amended article received the unanimous endorsement of all affected parties within the industry. This amended article, approved on April 24, 1934, and actually effective June 1, 1934, provides for a joint governmental and industrial organization to determine the proper inventories of gasoline for each district and the production of gasoline in each district necessary to meet the demand therefor.

The provision relating to orderly development of new pools is in its implications one of the most far-reaching provisions in the code, since it establishes a basis upon which any petroleum product may be properly conserved and the wastage incident to development in recent years eliminated.

Plans for the orderly development of new petroleum pools, submitted in compliance with section 7 of article III of the Code of Fair Competition for the Petroleum Industry, totaled 336 as of June 30, 1934. Of this number, 239, or approximately 71 percent, have been approved by the Petroleum Administrator. Of the 336 plans submitted, 18 were determined to be not new pools as defined by the new-pool regulations.

In approving the development plans, the problem of well spacing was given careful consideration. Wider well spacing than has hitherto been customary was one of the principal objectives, as a most effective means of obtaining the most efficient utilization of reservoir energy and of combating overproduction.

The Petroleum Administrator on December 20, 1933, authorized a study of the economic recovery cost of crude petroleum covering the 3 calendar years 1931, 1932, and 1933. The Administrator's order directed operators producing in excess of 5,000 barrels per annum in the eastern and Rocky Mountain areas, and 10,000 barrels per annum in all other States, to furnish the Petroleum Administrative Board the necessary data from which summaries could be made showing costs and other related information by States and pools within each State. Final analyses are now being made, and the report on the costs of production will be made public shortly.

The marketing division of the Board has worked constantly with the marketing subcommittee of the planning and coordination committee in an endeavor both to make article V, dealing with marketing, comprehensible and to adjust such of those provisions as appear

to be working undue hardship. Its activities in this regard are set forth in detail below. The marketing division has also aided in the collection of certain statistical data essential to obtain a proper picture of the costs of marketing, and has cooperated in the consideration of the various stabilization plans which have been proposed.

A major problem was presented to the Board early in its existence in the necessity under rule 19 of taking some action with reference to lease and agency, lease and license agreements, and other forms of exclusive dealing contracts. Agreements of this character provide the refiner or distributor of gasoline with a controlled outlet where he can maintain an assured portion of the market. In consequence they tend to discriminate against the products of independent marketers and possibly are in contravention of the fundamental provisions of the National Industrial Recovery Act.

The national marketing agreement, referred to elsewhere in this report, provided for the eventual liquidation of all such agreements. With the failure of the national marketing agreement, the Board conducted an independent study of this matter, and requested the Planning and Coordination Committee to forward a recommendation for a modification of the code substantially similar to that contained in the national marketing agreement. Action upon this recommendation is expected shortly.

Overproduction of crude oil, excessive refining capacity, and excessive production at refineries has produced surplus and distressed stocks of gasoline which have had a serious, depressing effect upon the market. The overexpansion of retail outlets by reducing the gallonage per station increases unit costs and leads to price cutting to obtain individual volumes. With less gasoline consumed today than in 1929, but with perhaps twice as many stations, and with surplus stocks, the stabilization of markets to preserve small enterprises and to permit the paying of code wages and maintenance of code hours has proved essential.

The conflict between the distributors selling at the regular price and those selling with a cut-price policy has been the most frequent immediate causes for price wars. Because of the complexities of the factors involved and the clash of policy, it has not been possible to determine a "right solution" for such conflicts. Therefore, the Petroleum Administrative Board has encouraged negotiations and discussions between all the parties involved in a price war on an experimental basis in an attempt to work out a technic for stabilizing markets.

There is no question but that some action must be taken to curb overexpansion of retail outlets. It is estimated that there are now approximately 350,000 service stations in the country. This number is far in excess of the number required to serve the consuming public.

This total has been reached in recent years, and represents a large increase, due partly to the marketing policies of the large refiners and partly to the pressure for outlets for production from new pools. The increase in stations has greatly diluted the gallonage through- for each outlet with a twofold result: Overhead costs have greatly increased, and an oversensitive market structure has been created so the slightest decrease in volume in individual outlets induces market breaks, which creates vicious price wars. It is obvious that a program directed toward the solution of the evils with which the industry is faced must include an equitable solution of this problem. It was early recognized that the success of the administration of the code depended upon vigorous enforcement of the production allocations and of the provisions regulating marketing practices. The program for enforcement involves complex and fundamental questions in constitutional law, combined with problems of proof of the interstate character of the petroleum industry. Members of the staff of the Board, trained in the legal problems involved, were designated as special assistants to the Attorney General, to cooperate with the United States attorneys in litigation involving the Petroleum Code and the regulations promulgated under section 9 (c) of the National Industrial Recovery Act. Representatives of the Board were usually in charge of the cases and prepared the briefs and argued the cases. In June, in accordance with the general policy established by the Department of Justice, the responsibility for litigation was undertaken by that Department. Hereafter, cases will be conducted by the United States attorneys. The legal staff of the Board stands ready to assist local United States attorneys upon call in preparing and prosecuting cases.

The first attempt to enjoin the enforcement of regulations promulgated under section 9 (c) was defeated in the Supreme Court of the District of Columbia in *Southport Petroleum Co. v. Ickes*. In *Panama Refining Co. v. Ryan* an injunction was obtained from Judge Bryant in the eastern district of Texas, against the enforcement of the regulations promulgated under section 9 (c) of the National Industrial Recovery Act. In *Amazon Petroleum Co. v. Ryan* a three-judge Federal court found that the orders of the Texas Railroad Commission limiting the production of oil in the exercise of its statutory power to prevent waste were not void on the theory that they were dictated by the Federal Oil Administrator. The court held it had no jurisdiction over Federal questions involved and those aspects of the case were assigned to the Federal district judge, Judge Bryant, who promptly issued an injunction against the enforcement of the production provisions of the code and the regulations under 9 (c). Upon appeal of the Panama and Amazon cases to the circuit court of appeals, Judge Bryant was reversed by a unanimous court, which held

the regulations under section 9 (c) valid and found it not necessary to pass upon the constitutionality of the production sections of the code in that case. The cases have been appealed to the United States Supreme Court.

Altogether, 22 cases have been instituted to enforce the oil-administration program; 6 of them have dealt with the control of production, 4 also involving the validity of regulations issued under section 9 (a) of the Recovery Act. Three cases involve labor provisions of the code; 14 involve various rules of the marketing section of the code.

BUREAU OF RECLAMATION

(ELWOOD MEAD, Commissioner)

Until settlement reached the borders of the arid region, public land in the humid section was the door of opportunity for the restless and enterprising. But when the wave of settlement reached the arid zone pioneers had to deal with new conditions and were confronted with new problems. Homes and civilization were limited not by land but by water. To make that water available required a new type of engineering knowledge and experience, while to make homes permanent and secure, codes of water laws had to be formulated and put into operation. Irrigable land became therefore the new frontier and is so today.

Private and district enterprises were able to build the simple channels which carry water to the valleys bordering streams, but when it became necessary to divert and control rivers and when storage of floods became a fundamental requirement, some agency with greater resources and with a continuity of policy which would reach beyond the limits of a single State was essential. Out of this need the reclamation fund and the Bureau of Reclamation were established.

Recently the opinion has prevailed in some sections that further construction of irrigation works is uneconomic and injurious. It arose out of an exaggerated conception of the area irrigated under Federal works, which is less than 1 percent of the total farmed area in the United States. Critics of irrigation have not realized how necessary the works being built are to the prosperity of the cities and towns and the industries located in that region. They do not understand the plight of valleys menaced with water shortages. If they did they would join the West in energetically urging the building of storage reservoirs. It required the great drought to show to the Nation the service which the reservoirs already completed is rendering and the need for early completion of those under way.

Already, early in midsummer, range stockmen are buying alfalfa as it is cut on the irrigated fields to save their flocks and herds from starvation. What the country where this is happening would be like if the lands that are now green and productive were not being irrigated can be understood only by those who have seen it.

Although it is only June the bed of the Rio Grande is dry. If the city of El Paso and the irrigated country around had to depend on the unregulated flow of that river this would be a year of calamity to 165,000 people. Fortunately the Elephant Butte Dam and Reservoir

were built by the Reclamation Bureau and the stored water is supplying the needs of those people. It not only enables that project to help feed the people in the surrounding country but saves the city of El Paso from an enforced exodus. Twice in the last 5 years the storage at American Falls on the Snake River has saved crops worth the cost of the reservoir, and this year the stored water will be worth the value of the farms and fields which it supplies with moisture.

The Federal reclamation projects in the valleys of the North Platte, Klamath, Pecos, Cheyenne, Yellowstone, and Big Horn rivers will be called upon to supply the local needs for both human and livestock consumption. They will save towns and counties from depopulation and save livestock, which will be sorely needed next year.

The reservoirs that are furnishing water this year to the Yakima, Okanogan, Orland, and Boise projects have enabled fruits and vegetables to be grown that are being shipped to widely separated areas in the arid region and to the Central States which have no crops this year. The Echo Reservoir in Utah, built against the protests of those who see in irrigation nothing but a contribution to the surplus, is saving the vegetable canning industry of Utah and will do much to feed the surrounding country this winter. The beet sugar industry of the arid region is one of the most valuable features of its agriculture. Millions of dollars are invested in factories. Many thousands of workers are employed. The beets required to supply these factories are being grown by water stored in the reservoirs on the North Platte, the Belle Fourche, Minidoka, Strawberry Valley, Shoshone, and Milk River projects. The Salt River and Newlands projects are the financial mainstays of the States of Arizona and Nevada. Both States need more irrigation to furnish winter feed for range livestock and to meet the local food requirements of their cities and towns. It is no exaggeration to say that no greater contribution could be made to the stability of both States than to complete the reservoirs being constructed on the Colorado, Humboldt, and Truckee Rivers.

The importance of continuing the program of construction now under way is most strikingly shown by the situation on the Colorado River on which Boulder Dam is being built. If it had been completed 2 years ago the irrigated Southwest would not have known there was a drought. Because it is not completed and because water could not be stored this season 70,000 people in the Imperial Valley are faced with appalling disaster. They lack water for irrigation, for watering livestock, and for domestic purposes. It is too early to fix the limit of loss but it will be equivalent to a good part of the cost of the dam. If Boulder Dam were not assured there would be a panic in the Southwest.

The drought is creating a demand for irrigated areas that has been absent for the past 10 years. It gives a new significance and impor-

ance to the irrigated farms now available and to the few localities where additions can be made to the irrigated area.

Furthermore, where farmers are transferred from submarginal dry areas to farms under irrigation, for every acre of irrigated land that they cultivate two or more acres of dry land will go out of production and the net result will be the elimination of areas that are now adding to the troublesome agricultural surplus, especially wheat, and increase in the production of crops needed locally.

The time has come for an appraisal of the relation of irrigated agriculture to the civilization and future well-being of the western third of the country. Each irrigated area brings tangible money benefits to many others besides those who live on the lands irrigated. Cities are created and sustained. Phoenix, Ariz., is as much a creation of irrigation as are the citrus groves and alfalfa fields that surround it. These irrigated oases lessen the risk and increase the income of the stockmen of the range country for miles around. They create taxable valuations and incomes that help support city, county, State, and Federal Governments. Irrigation communities are a market for manufacturers and merchants in remote industrial centers. No true economic balance sheet of any project can be made without including these indirect benefits which should be considered but have been overlooked in the past.

An economic survey of a few typical reclamation projects is recommended. Such a survey should be taken to determine the economic condition of the irrigators who have entered into contracts with the United States to repay construction costs. It should aim to appraise the agricultural opportunities and possibilities of the project and the extent to which they are being utilized. It should collect data as to the extent to which contract payments are being made, and when not being made, the reasons therefor. Consideration should be given as to whether the plan of repayment is fair to the irrigators and also to the agriculture outside of these projects and if there are objections they should be stated and modifications proposed. This survey and appraisal of existing projects will help to inform the whole country regarding the achievements or defeats of our reclamation policy and as to what, if any, modification should be made in the present reclamation law.

It should include a study of the relations of irrigation and power as part of the reclamation policy. The past 15 years have shown the importance of power development as an adjunct to irrigation enterprises, but to the present time no definite policy has been inaugurated regarding the ownership of these power plants, the plan of operation, and the disposition of their profits. The Bureau believes they should be built and operated as permanent Government works and that the profits after the works have been paid for, should go into the reclama-

tion revolving fund to be used in building additional projects. If this plan is to be followed legislation is needed.

CONSTRUCTION ACTIVITIES DURING FISCAL YEAR

With \$103,535,000 allotted by the Public Works Administration for continuation of work on existing projects and starting work on new projects, construction activities took on a new impetus and the Bureau had more to do than at any time in its history. It was necessary to increase the Denver office working force from 250 to 700 to handle this extensive program and make necessary studies and investigations, design the various structures, and prepare plans and specifications for bidding. In addition our engineers did all the design and specification work for the Tennessee Valley Authority in connection with the Norris and Joe Wheeler Dams, and also the Caballo Dam on the Rio Grande for the International Boundary Commission.

On the Vale project in eastern Oregon, with \$1,000,000 available a contract was let in February 1933 to Hinman Brothers, Denver, Colo., for \$496,286.10 to build the Agency Valley Dam and Reservoir on North Fork of Malheur River near Beulah. The dam is a moistened and rolled embankment of clay, sand, and gravel, with a maximum height of 90 feet. The reservoir will supply needed additional storage for the project lands.

The first work undertaken on the \$22,700,000 Casper-Alcova project, on the North Platte River near Casper, Wyo., was the diversion and outlet tunnel at the site of the Alcova diversion dam. The Lawlor-Woodward Co. of Seattle, Wash., has the contract at a price of \$269,905 and on June 30 the work was 60 percent completed. In March of this year contracts were let for building the first 3½ miles of the Casper Canal extending northeasterly from the Alcova Dam site. The contractors and contract prices are as follows: Utah Construction Co., Ogden, Utah, schedule 1, \$225,990; J. A. Terteling & Son, Spokane, Wash., schedule 2, \$89,865; Edward Peterson, Omaha, Nebr., schedule 3, \$293,465. A service road on the west side of the North Platte River, 3 miles in length, was built from a point on the county road 36 miles northeast of Parco to the Seminole dam site. Government forces constructed a 66-mile transmission line from Casper to the Alcova and Seminole Dam sites and two substations.

An allotment of \$5,000,000 was made available for continuing construction on the Owyhee project in Oregon-Idaho, and in November 1933, J. A. Terteling & Sons, Spokane, Wash., received a contract for building 30 miles of the North Canal and also the Mitchell Butte lateral, all in the Mitchell Butte division, at a price of \$492,075.75. Structures were let under a separate contract to Barnard-Curtis Co. of Minneapolis, Minn., for \$154,290. The Morrison-Knudsen Co., Boise, Idaho, was awarded a contract for \$162,518.50 for con-

constructing a 10-foot 6-inch diameter plate-steel siphon across Snively Creek and a 9-foot diameter siphon across the Owyhee River on the North Canal.

The first of the four Salt Lake Basin projects in Utah, financed with P.W.A. funds, to be undertaken was the Hyrum project near Logan. In January 1934 J. A. Terteling & Sons of Spokane, Wash., obtained a contract for building the Hyrum Dam and Reservoir on Little Bear River at a price of \$337,211. The reservoir will have a gross capacity of 18,000 acre-feet and net capacity of 14,000 acre-feet above the outlet for project canals. The dam is an earth-fill structure with a maximum height of 90 feet.

The first work on the \$63,000,000 Columbia Basin project in Washington, for which \$15,000,000 was made available, was excavation of 2,040,000 cubic yards of overburden at the Grand Coulee Dam site. David H. Ryan, of San Diego, Calif., was awarded the contract in December 1933 for \$534,500 and completed it in June. The Western Construction Co., of Seattle, Wash., began work in March on concrete piers for the Columbia River bridge, the contract price being \$180,177.40. On May 17 bids were opened for building the United States Construction Railroad from Odair on the Northern Pacific to the dam site, a distance of about 30 miles. Contract was awarded July 18 to David H. Ryan, of San Diego, Calif., with a bid of \$235,570. The Erick & Kuney Co., of Spokane, was awarded a contract on June 4 for grading and structures for highway and construction railroad in the coulee at their bid of \$220,676.50. Bids were opened on June 18 for construction of the Grand Coulee Dam and power plant. The low bid of \$29,339,301.50 was submitted by Silas Mason Co., New York City; Walsh Construction Co., Davenport, Iowa; and Atkinson-Kier Co., San Francisco, Calif., acting jointly. Contract was awarded July 13. Street grading in the Government camp site was started and at the end of the year preparations were being made to advertise for construction of water and sewer systems and residences.

An allotment of \$600,000 was made for the Sun River project in Montana to build additional laterals and drains. The first contract was awarded in January 1934 for earthwork and structures for open drains in the Greenfields division to the Morrison-Knudsen Co., of Boise, Idaho, for \$72,105. At the end of the year plans and specifications were ready for the Mill Coulee and lateral extensions.

Construction of open drains on the Yuma project in Arizona and laterals on the Milk River project in Montana was continued. On the Elephant Butte division of the Rio Grande project, New Mexico-Texas, construction of drains and laterals was in progress. With an allotment of \$100,000 reconstruction of canals and structures was carried on in the Stanfield irrigation district in Oregon. Similar work

was also in progress in the Bitter Root irrigation district near Hamilton, Mont.

During the year just closed the Bureau in its construction activities built 89 miles of canals and drains; 37 tunnels with a total length of 6,926 feet; 1,029 canal structures, 70 bridges, and 265 culverts; and laid 2,723,165 feet, or 516 miles, of pipe. There were excavated 7,958,165 cubic yards of earth and rock, making the total to date 326,962,284 cubic yards. The Bureau used 2,666,972 barrels of cement and placed 2,403,346 cubic yards of concrete.

STATISTICAL DATA

The area irrigated in 1933 with water from Government works was 2,828,787 acres, an increase of 59,182 acres over that for 1932.

The area cropped was 2,797,815 acres, an increase of 22,535 acres.

The total value of crops was \$84,191,733, an increase of \$34,033,352 compared with 1932, and of \$10,231,356 compared with 1931. This increase in crop values was due largely to increased prices received for crops.

During the period 1906, when water was first available, to and including 1933, the cumulative value of crops grown on land irrigated from Government works amounted to \$1,970,239,991.

Construction payments in cash and credits from power and other sources received during the fiscal year 1934 were \$481,192.26, a decrease of \$406,268.42 compared with the previous year.

Payments for operation and maintenance were \$1,122,473.99, a decrease of \$15,929.20 compared with the previous year.

Total payments amounted to \$1,603,666.25 compared with \$2,025,863.87 in 1932, a decrease of \$422,197.62. Income to the reclamation fund from all sources during the fiscal year was \$4,424,862.69, or \$263,392.88 less than for the previous year.

The operation expense for the year was \$1,108,950.07, a decrease from the previous year of \$18,444.33.

Excess of operation and maintenance receipts over expense for the period amounted to \$13,523.92 compared with an excess of receipts over expense of \$11,008.79 for the previous year.

Construction work was carried on with funds provided under the National Industrial Recovery Act. A total of \$103,535,000 was allotted to the Bureau.

Operation and maintenance of the irrigation, drainage, and power systems was carried with direct appropriations from the reclamation fund, money advanced by the water users, organizations, and revenues from power operations.

The act of March 27, 1934, extended the provisions of previous acts granting temporary relief to water users on irrigation projects, and

construction charges coming due for the year 1934 were not required to be paid. This explains the reason for decreased payments as given under this heading.

ADJUSTMENT CONTRACTS

On June 12, 1934, December 27, 1933, and January 11, 1934, respectively, adjustment contracts under the act of Congress of May 25, 1926 (44 Stat. 636), were made with the Grandview irrigation district, Yakima project; the Langell Valley irrigation district, Klamath project; and the Horsefly irrigation district, Klamath project. During the fiscal year adjustment arrangements under the moratorium acts were made on all of the projects where construction charge installments would otherwise have been collectible.

SETTLEMENT ACTIVITIES

In line with the policy of the Administration to limit the further development of productive areas, only one acreage of consequence was opened to entry during the past fiscal year. On the Kittitas division of the Yakima project, Wash., 25 farm units were thrown open on May 1, 1934, involving a total irrigable area of 1,843 acres. Owing to the prevailing drought conditions the demand for irrigated farms showed a marked increase and 87 formal filings were made for the small number of units included in the Kittitas opening. Of the 78 who appeared before the examining board 62 were residents of the State of Washington, the remaining applicants coming from nearby States. By July 5 all units, with the exception of three on which appeals were pending, had been awarded.

On the projects for the construction of which the Public Works Administration has allotted funds, irrigation development which would bring into cultivation appreciable additional areas is not included in the authorization.

VERDE PROJECT, ARIZONA

An allotment of \$4,000,000 was made by the Public Works Administration for this project, of which \$500,000 was for making investigations and estimates of cost of a project comprising an area of land of about 85,000 acres, the feasibility of which depends upon the quantity of water that can be depended upon for irrigation. Studies have been under way to determine this important matter as well as investigations to determine feasible dam sites for the storage of water on the Verde River. All of this work was still in progress at the close of the fiscal year and a conclusion had not been reached as to the feasibility of the project.

*ECONOMIC AND ENGINEERING OPERATIONS**SALT RIVER PROJECT, ARIZONA*

Agricultural conditions showed some improvement over last year. Crop returns showed a gain of \$3,000,000 (approximately 30 percent) over the very low figure of 1931-32, which still left the crop receipts less than half the 1929 figure. The increases were in the major acreage crops, such as alfalfa, cotton, and grain, which were \$4,000,000 greater than in 1931-32, but a drop of \$1,000,000, mainly in lettuce, reduced the net gain to approximately \$3,000,000. It is anticipated there will be a further improvement during 1934. Restricted water supply, unfortunately, will prevent many farmers from taking advantage of the apparently favorable outlook for lettuce and other cash crops, which will be comparatively free from competition of large nearby areas whose crops cannot be depended on because of the drought. The rapidly decreasing water stored in the four project reservoirs, owing to the entire failure of the winter and spring run-off and continued absence of rain, has necessitated drastic restriction in water apportionment and maximum operation of all pumps for utilizing underground water. Unless increased by summer rains, the stored water at the end of the irrigation year, September 30, 1934, will be reduced to around 100,000 acre-feet. The year 1933-34 is among the driest of record in 46 years. In addition to the restricted irrigation supply the low head in the reservoirs on June 30 was at a point where the project hydroelectric plants were barely able to handle peak loads. This condition exists in spite of the reduction in power load caused by the almost complete cessation of mining operations which consumed a large part of the system output of electric energy.

YUMA PROJECT, ARIZONA-CALIFORNIA

Economic conditions on the project improved during the year, to which the several relief acts passed by Congress, extending construction repayments, and a rigid curtailment of operation and maintenance expenses were the principal contributing factors. The Yuma County Water Users' Association has paid in full all operation and maintenance charges due the Government during 1934 and advanced a substantial payment on the charges due in 1935. The project has only one bank, making few, if any, farm loans, so that water users must rely mainly on Government loan agencies for financial assistance. The Cotton Finance Corporation has made loans for financing both the 1933 and 1934 cotton crops. Other cotton growers were aided through the Crop Production Credit Corporation. The Farm Bureau Marketing Association, a cooperative handling mainly alfalfa hay

and seed, completed a successful year by retiring all indebtedness with bank credit established for financing 1934 operations.

Yuma Mesa.—There was no new development on the Mesa unit, and although prices for citrus products were the same, returns were less during 1933 than for the preceding year because of materially reduced yields. Prevailing prices were \$0.01 and \$0.0125 per pound. The Yuma Mesa Citrus Growers' Association marketed the crops.

The only construction work in progress was confined to extensions to the drainage system and the rebuilding of about 1,100 feet of levee which was lost in the 1921 flood.

BOULDER CANYON PROJECT, ARIZONA-NEVADA

Construction in Black Canyon was in progress on practically all the major features of Boulder Dam, power plant, and appurtenant works. The contractor, Six Companies, Inc., continued to prosecute the work in an efficient and rapid manner. The peak of employment occurred on June 30, when 5,218 employees were listed on the pay rolls of the Bureau of Reclamation and project contractors. The average number of men employed in construction was highest in May, when 4,648 were working for the Government and contractors, and the gross pay roll was \$743,581.77. The Public Works Administration made an allotment of \$38,000,000 for continuing construction on this project.

Excavations in the river channel for the dam foundation were completed and the first concrete placed in the dam on June 6, 1933. Seven months after starting, a million yards had been placed; three and a half months later half of the concrete for the structure had been poured; and at the end of the fiscal year the volume of concrete in the dam amounted to 2,135,030 cubic yards, raising the structure to a height of 435 feet above bedrock. The record concrete pour for 1 day occurred on March 20, when 8,904 cubic yards were deposited in the dam, and another 1,558 cubic yards placed in other structures. Cooling was started on August 8 and was completed to elevation 745 on June 30, 1934. Grouting of contraction joints was commenced on May 24 and finished to elevation 625. The slot was poured to elevation 745.

The channels, weirs, and piers of the spillways were practically completed, and lining of the inclined tunnels was in progress at the end of the year. The four drum gates were installed for the Arizona spillways and their erection was progressing for the Nevada structure.

Concrete was poured in all intake towers, the four lower gates were installed, and erection was started in May for the upper gates in the Nevada downstream tower. At the end of the fiscal year the lowest tower was 130 feet above its base and the highest, 172 feet.

Excavations were practically completed for all of the 92 tunnels and 13 shafts that were driven for project construction. The two 37-foot diameter penstock-header tunnels and the 18-foot inclined penstocks were lined with concrete, and lining was nearly finished for the horizontal penstocks.

The canyon wall valvehouses, construction adits, and connecting roads were excavated. The outlet pipes of 8½-foot diameter were installed in the Arizona tunnels and were placed in position ready for erection in the Nevada tunnels. The first concrete was poured for the powerhouse wings in January, and at the end of the fiscal year concreting was in progress for the entire lengths of both wings. Six Companies, Inc., has made arrangements to haul the plate steel pipe from the fabrication plant of the Babcock & Wilcox Co. to the 150-ton Government cableway.

The Babcock & Wilcox Co. gradually increased production of fabricated pipe until in June, 1,582 tons of pipe were completed or at an average rate of 52.7 tons per day.

The penstock header and penstock tunnels were rapidly being made ready for pipe installation, and the first of the 30-foot sections are expected to be shipped to the tunnels in July 1934.

A great amount of interest was displayed in construction activities, the visitors checked at the reservation gate numbering 191,788 for the year. A monthly peak of 30,371 occurred in March and a week-end peak of 5,461 on March 24-25. The Boulder Dam Hotel was completed in Boulder City in December, and several hotels were available in Las Vegas, but on many week-ends the two towns were hard pressed to accommodate their guests.

The bureau of power and light of the city of Los Angeles commenced construction of the world's largest transmission line, to carry Boulder Dam power to Los Angeles, at line voltage of 275,000. Items of interest are its length of 270 miles, the steel towers 109 and 144 feet in height, and the 1,626 miles of hollow core copper tube, 1.4 inches in outside diameter.

ALL-AMERICAN CANAL, ARIZONA-CALIFORNIA

The construction of the All-American Canal was authorized by the Boulder Canyon Project Act of December 21, 1928. An allotment of \$6,000,000 for this project was made by the Public Works Administration in November 1933, but because of legal requirements connected with the execution of a repayment contract, the funds were not available until March 20, 1934. Work was promptly started and drawings and specifications prepared and bids received June 7. Contract for earthwork covering schedules 1 to 6, inclusive, was awarded to W. E. Callahan Construction Co., St. Louis, Mo., and Gunther & Shirley, Dallas, Tex., the amount of their bid being \$4,859,587.

Schedule 7 covering rock excavation was awarded to Griffith & Co., Los Angeles, at a bid of \$226,800. These contracts cover 30.6 miles of earthwork on the All-American Canal from a point opposite Laguna Dam through the sand hills area to the site of the proposed bifurcation works for the Coachella Canal. The capacity of this portion of the canal varies from 15,155 to 10,155 cubic feet per second.

The contract dated December 1, 1932 with the Imperial Irrigation District for construction of the All-American Canal was contested by the Coachella County Water District which desired a separate contract with the United States instead of having to become part of the Imperial Irrigation District. The Imperial District contract was validated by the court on July 3, 1933. An appeal was carried to the Supreme Court, but was dismissed in February 1934, by the Coachella Valley County Water District after this district had settled its controversy with the Imperial Irrigation District. A contract for construction of capacity for its use in the All-American Canal was negotiated with the Coachella District and submitted to the Department for approval. A contract was also negotiated and approved as to form by the Department on May 16, 1934 with the city of San Diego for provision of capacity in the All-American Canal for use by the city.

ORLAND PROJECT, CALIFORNIA

A slight improvement was noticeable in the economic condition of the project owing to the general advance over prices received for farm products the preceding year. Crop yields, with the exception of oranges, were uniformly satisfactory. Because of the unprecedented cold temperatures of December 1932, there was practically no production of citrus fruits in 1933. At the end of the fiscal year, however, the prospects for a good crop had materially brightened. Actual collections of reclamation charges were, on account of the deferment of the payment of construction charges under the act of April 1, 1932, rather light, aggregating \$32,330.77 as against \$53,359.46 during the fiscal year 1933. Loans obtained from the Federal Farm Loan Bank of Berkeley, Calif., were of a very decided assistance to the water users in enabling them to pay their operation and maintenance charges. The crop value of \$29.33 an acre for 1933, showed an increase of \$5.50 over that of the preceding year. Reduction in available funds prevented the carrying forward of the concrete lining program on laterals subject to excessive loss of water and high maintenance cost.

GRAND VALLEY PROJECT, COLORADO

During the 1933 season 470 farms were irrigated with an average crop value per acre of \$21.75 as compared with \$16.26 for the previous season. Charges for water were reduced, by means of drastic econo-

mies and of lower material and labor costs, from \$3.50 for 4 acre-feet in 1932 to \$1.30. The beet sugar factory at Grand Junction, which had been idle for several years, operated during the season of 1933-34. The Colorado Potato & Bean Growers Associations operated successfully during the year and handled a large part of these crops for project farmers. Crop financing was largely taken care of by Federal agencies and numerous land loans were made in the vicinity of the project by the Federal Land Bank. Exclusive of a slight amount of work to complete the Grand Valley power plant no construction work was done on the project during the fiscal year. In June 1934, preparations were being made to undertake a limited amount of work on drainage extensions from operation and maintenance funds.

UNCOMPAHGRE PROJECT, COLORADO

During the 1933 irrigation season 1,589 farms were irrigated, 776 being farmed by owners and 813 by tenants. The average crop value of \$22.03 per acre was approximately double that of 1932. The beet sugar factory at Delta, Colo., handled all beets raised on the project. The Colorado Potato Growers Association, the principal marketing organization, handled potatoes and onions chiefly. A number of poultry and hog associations, as well as cooperative oil and service stations, continued to do business as successfully as could be expected under existing economic conditions. The Uncompahgre Valley Water Users' Association assumed control of the operation and maintenance of the project on January 1, 1932. No construction work was in progress. Recent legislation granting a moratorium for the construction charges has postponed the starting of the drainage program. The Public Works Administration allotted to the project \$2,725,000, of which \$2,400,000 was allocated to the building of the Taylor Park Dam and additional concrete lining in the Gunnison Tunnel and \$325,000 to the rehabilitation of existing structures on the project. Taylor Park Reservoir will provide a necessary supplemental water supply for the project.

BOISE PROJECT, IDAHO

Low prices for farm products prevailed in 1933. The prospects for 1934 have improved, but with some reduction in yields because of a short water supply. Cooperative buying and selling organizations are active and still growing in the dairy, poultry, and fruit business and numerous other lines. No construction is in progress, although a small amount of drainage in the Black Canyon and Boise-Kuna districts is contemplated. An early beginning on repairs to the Arrow-rock Dam is also planned. Operation and maintenance of the reserved works (2 storage dams, 2 diversion dams, 2 power plants, and 1 pumping plant) is being continued by Government forces, while the

maintenance of the canal system and distribution of water have been turned over to the water users. Needs for the future consist mainly of a supplemental supply of water for the Arrowrock division, the year of 1934 being a season of 60 percent supply. Public interest centers around the scheme to divert water to the Boise River from the Salmon River watershed.

KING HILL PROJECT, IDAHO

The operation of the King Hill project has been continued by officials of the King Hill Irrigation District. The cropped area for the season of 1933 was approximately 7,300 acres, with an average value per acre of \$16.85, an increase of more than \$6 from the season of 1932. The project is making a slow recovery from the financial depression with prospects for increased revenues for 1934, resulting from better prices for farm products.

MINIDOKA PROJECT, IDAHO

There were 1,528 farms irrigated on the gravity division last year, and 862 on the south side pumping division. The total crop value the past year averaged \$29.40 compared with \$14.50 in 1932. As a result there has been a general improvement in financial conditions on the project. The snowfall on the Snake River drainage area during the winter of 1933-34 was extremely light, so that both Jackson Lake and American Falls Reservoirs failed to fill this year. By the end of June, about 70 percent of the project's total stored supply had been exhausted. At Jackson Lake clearing of timber around the reservoir was prosecuted by several Civilian Conservation Corps camps. The enlargement program of the south side pumping division was continued throughout the year and additional pumps were installed. About 3 miles of drains also were built on the pumping division.

On the Gooding division, some 89 small lateral structures were built by contract, and 3 main canal checks and 1 flume across the canal were constructed by Government forces. Future needs of the project include provision for an additional water supply. It appears advisable to complete the enlargement of canals and to increase pumping capacity on the south side pumping division. A form of contract between the United States and the Idaho Power Co., providing a means of conserving winter water for storage at American Falls Reservoir, was under consideration.

BITTER ROOT PROJECT, MONTANA

The United States in 1930 assisted this project in refinancing its bonded and warrant indebtedness and in making some necessary improvements on the canal system. The work was continued during

the past fiscal year under the supervision of the Bureau of Reclamation and \$90,000 was advanced to the project for this purpose. There is a balance of \$30,000 to be advanced early in the next fiscal year, which will complete the total of \$250,000 authorized by Congress for the rehabilitation of the project. The area under cultivation remains approximately 15,000 acres, with an average crop value of \$15.70 for the season of 1933 and prospects for a greater improvement in 1934.

HUNTLEY PROJECT, MONTANA

During the 1933 irrigation season 651 farms were irrigated, 310 operated by owners and 341 by tenants. The average crop value per acre was \$30.14. Sugar beets remained the principal cash crop with an average yield of 14.86 tons per acre. Practically all the lambs and wool grown on the project are marketed through the Wool Growers Association. During the early part of 1933 improvements were made in the pumping plant from the main to the highline canal which resulted in an increased discharge of about 6 cubic feet per second. The construction of a reservoir at Anita would materially reduce the cost of water delivery to the Fly Creek division as well as improve the service. A low rock and brush dam in the Yellowstone River below the main canal headgates has been necessary for several years in order to operate the canal at full capacity during July and August. Design of a permanent reinforced concrete structure to replace the present temporary structure has been made and construction work will be started in the near future.

MILK RIVER PROJECT, MONTANA

The season of 1933 was unusually hot and dry, but crop yields were much above the average and the upward trend of prices increased the average value of crops from \$12.80 in 1932 to \$19.60. Sugar beet acreage had increased to more than 10,000 acres which, for the first time in the history of the Chinook factory, provided for a full capacity campaign. Some additional property sales were completed as a result of which dry land farmers took land under the canals. Plans were formulated for the establishment of a subsistence homestead colony on the Malta division to comprise an area of about 2,500 acres of land. There was an improvement in the payment of operation charges during the year and sufficient funds were available for the continued operation of all canal systems, with some curtailment necessary on the Glasgow division in order to balance costs and funds available. An allotment of \$65,000 was made for continuing construction work on the project, comprising principally the replacement of wood structures and improvements on the St. Mary Canal. An allotment of \$2,000,000 was made for the construction of a storage

dam and reservoir on Milk River. Investigations have been made and a feasible dam site selected. At the close of the year a repayment contract was being negotiated.

SUN RIVER PROJECT, MONTANA

Conditions on the project have continued to improve with a further reduction in the wheat acreage and an increase in crops better adapted to irrigated farming, particularly an area of about 4,000 acres of seed peas. Interest in sugar-beet culture with prospects of a gradual increase in acreage is being shown. Many inquiries have been received asking for information about farms that may be available for entry or for sale from farmers living on adjacent dry-land areas. Opportunities will be very limited until lateral extension work now under way has been completed. An allotment of \$600,000 was made in 1933 which is being used for further extensions to the drainage system and the extension of the lateral system to bring under irrigation lands located in the easterly end of the Greenfields division and the Mill Coulee division. Contract for the construction of drains was awarded to Morrison-Knudsen Co., of Boise, Idaho, and for canals and structures to Lease & Leigland, of Great Falls, Mont. The canal systems have been operated by the officials on the Fort Shaw and Greenfields irrigation districts.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

Conditions on the project continued to improve during 1933, with an average crop production of \$30.40 per acre, which was \$9 more than in 1932. The irrigated area of 33,900 acres had also increased about 8 percent. Notwithstanding improved conditions the farmers have found it difficult to meet their financial obligations and every effort is being made to reduce operation and maintenance costs. The canal system is under the supervision of the joint board representing the irrigation districts in the two States. The existing moratorium has relieved the farmers from the payment of construction charges. Owing to depressed agricultural conditions very little settlement work has been carried on. The irrigation districts have succeeded in getting buyers for all of the farms taken over for nonpayment of taxes which have been sold on contract for deed with small down payments. Drought conditions have caused a demand for farms to rent, greatly in excess of the supply of those having suitable buildings.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The run-off of the North Platte River at Pathfinder for 1933 was below normal and, although the irrigation supply was ample, the balance remaining in storage was only 105,000 acre-feet. The present water-year has been the driest of record in nearly 40 years, the run-off

being less than 30 percent of normal, which is 1,400,000 acre-feet. About one-half of the available supply had been used previous to June 30, 1934, and while crops were generally in satisfactory condition on that date rain will be necessary during the balance of the season to insure beet and late potato yields and to prevent extensive damage to alfalfa fields. The economic condition of the project has shown substantial improvement during recent months. Irrigation district organizations have made drastic reductions in wages and other expenditures. The area reported cropped in 1933 was 182,500 acres with an average value per acre of \$26.08. Winter feeding of cattle was on a normal scale for 1933-34 but spring sales were unprofitable. About 130,000 head of sheep were fed and showed a reasonable profit. Cooperative marketing of turkeys was continued on an increasing scale and a cooperative dairy products association continued in operation. Construction during the fiscal year 1934 comprised completion of a new transmission line on the north side of the river between the Lingle plant to the city of Mitchell via the towns of Torrington and Morrill. The reserved works of the project, comprising Pathfinder and Guernsey Reservoirs, Whalen Diversion Dam, and the power system, were operated and maintained by the Bureau. The project canal, lateral, and drainage systems were operated and maintained by the project irrigation districts. Wholesale rates for electrical energy have been reduced approximately 15 percent, the base rate being \$1.50 per kilowatt per month, demand charge and an energy charge ranging from \$0.015 to \$0.0055 per kilowatt-hour, based on quantity used.

HUMBOLDT PROJECT, NEVADA

An allotment of \$2,000,000 was made by the Public Works Administration for the construction of a storage reservoir on the Lower Humboldt River to provide a supplemental water supply for the irrigable lands in the vicinity of Lovelock. Surveys and investigations were promptly started, as well as negotiations with the landowners on the required repayment contract. At the close of the year the contract had been prepared and approved by the electors of the district, plans and specifications covering the construction of the Rye Patch Dam were completed, and the work was ready to be advertised as soon as all legal matters had been adjusted.

NEWLANDS PROJECT, NEVADA

The project experienced a serious water shortage in 1933 with even more serious conditions prevailing in 1934. It was necessary to resort to pumping from Lahontan Reservoir and drainage ditches in order to supply some of the water required for irrigation. Four thousand acre-feet of water in Donner Lake were purchased at a price

of \$2.50 per acre-foot. Negotiations were finally completed in 1934 for pumping 36,000 acre-feet of water from Lake Tahoe, which will be divided between the irrigation interests on the Truckee Meadows and the Newlands project. There was a slight increase in crop values but owing to continued low prices of farm products, the value of crops for 1933 reached only \$12.23. Federal assistance has been extended to the project by the Civil Works Administration and also the Federal Emergency Relief Administration. Every effort has been made to reduce operation and maintenance expenses and the charges have been fixed by the district at \$1 per acre with the privilege of paying in three installments. The Truckee-Carson irrigation district has continued the operation of the project. No construction work is in progress but an application has been filed with the Public Works Administration for an allotment of \$500,000 to cover numerous project betterments, enlargement of the Truckee Canal, and increased capacity of Lahontan Reservoir.

TRUCKEE STORAGE PROJECT, NEVADA

This project was granted \$1,500,000 for the construction of a storage reservoir on the headwaters of the Truckee River for the purpose of supplementing the water supply of the Truckee Meadows adjacent to the city of Reno. Preliminary investigations have heretofore been conducted and a feasible dam and reservoir site located on the Little Truckee River. In view of the complicated water situation existing on this river system and the necessity of reaching an agreement as to the extent and priority of existing rights, considerable time has been required to reach a satisfactory adjustment of these matters. At the close of the fiscal year good progress had been made and a repayment contract drafted and submitted to the Washoe County water conservation district, which will assume the obligation of repaying the cost of this storage reservoir.

CARLSBAD PROJECT, NEW MEXICO

There were 438 farms cultivated during the year by owners and managers and 159 by tenants. The total acreage irrigated was 24,624 acres. Crop yields for 1933 averaged \$47.49 per acre or an increase over 1932 of \$27.90 per acre, which was due to increased yields and better prices for products. Financial conditions were much improved. The land bank deposits were \$540,000 on June 30, 1934. Prices of farm lands range from \$100 to \$250 per acre. The Federal land bank loaned about \$650,000 on this project.

Loans for crop production were confined to Federal agencies. Industrial development, which was confined to the potash and oil industries east of Carlsbad, has been substantial. The water supply

for the project was adequate except for alfalfa during the latter part of the fiscal year. Drought conditions prevailed in the Carlsbad area in the spring and early summer of 1934. Storage water was entirely gone at the close of the fiscal year, with the normal run-off lower than at any time in the history of the project. No construction work was in progress but the irrigation district has submitted an application for funds to construct the Alamogordo Reservoir.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

There was a marked improvement in conditions on the project with an increase in the number of farms and the area under irrigation. The average crop value was \$45 per acre, an increase of approximately \$19 over the average value for 1932. Cotton still remains the important cash crop on the project. The Cotton Growers Association, a strong organization with a large membership, provides crop financing through intermediate credit banks as well as cooperative marketing. The city of El Paso forms an important market for the sale of dairy products, livestock, vegetables, and truck, most of which are marketed through cooperative agencies. Construction work during the fiscal year has been limited to extensions to the drainage system in the Elephant Butte district. Further extensions will be required to relieve scattered areas of water-logged land throughout the project. An allotment of \$500,000 has been made for continuing construction of subsurface drains and extensions to the lateral system.

BAKER PROJECT, OREGON

The financial interest of the United States in the Baker project is limited to the construction of a storage reservoir on the Powder River at a cost of \$276,588, for which the irrigation district has contracted to make repayments under the provisions of the Reclamation Act. The work was completed in June 1932. The storage reservoir and canal system is operated by the irrigation district. The area under cultivation for 1933 was approximately 6,300 acres, with an average crop value of \$11.34 per acre.

STANFIELD PROJECT, OREGON

The project is located in Umatilla County, eastern Oregon. It was originally constructed in 1905 by the Furnish Ditch Co. for the irrigation of approximately 10,000 acres in the vicinity of Stanfield, Oreg. The main canal diverts water from the Umatilla River. The water supply in part is obtained from the McKay Reservoir under contract for 15,000 acre-feet with the Bureau of Reclamation. An allotment of \$100,000 has been made by the Public Works Administration for refinancing and rehabilitating this project, and a repay-

ment contract with the Stanfield irrigation district was executed February 12, 1934. A contract for the construction of three siphons and a tunnel on the Furnish Canal and a drain with structures was awarded to J. A. Terteling & Son of Spokane, Wash., in April 1934 at the bid price of \$49,593 under Specifications No. 568. Work is in progress on the Shaw and Hard siphons and tunnel. The drainage ditch has been completed and the entire contract was 20 percent completed on June 30.

UMATILLA PROJECT, OREGON

The operation of the east and west divisions of the Umatilla project has been continued under the respective irrigation district organizations, the combined irrigated area of the two projects being approximately 11,000 acres which in 1933 produced crops with an average value of approximately \$16 per acre. The farmers have experienced some difficulty owing to low prices of farm products and also to the fact that large areas of alfalfa were winter-killed, and as a result many of the farmers on the project have been on relief rolls. The prospects for the season of 1934 are very much brighter as a result of the increase in the value of crops.

VALE PROJECT, OREGON

The canal system on this project has been completed to deliver water to about one-half of the 30,000 acres of irrigable land. Good progress has been made in the settlement of this area and there are now more than 160 settlers engaged in clearing the land and planting crops. Yields have been good but prices received for commodities have been low. Alfalfa is the principal crop on the project and is either sold in the stack or fed on the farm. With few exceptions farms are operated by the owners.

An allotment of \$1,000,000 was made to the Vale project for constructing the Agency Valley Reservoir, for which contract was awarded in January to the Hinman Bros. Construction Co. of Denver, Colo. A second contract was awarded for the construction of about 4½ miles of highway to replace the present road which will be submerged. The allotment was of sufficient size to permit an extension of the main canal, estimated to cost about \$150,000. Specifications for this work have been prepared and invitation for bids is to be issued early in the ensuing fiscal year.

KLAMATH PROJECT, OREGON-CALIFORNIA

The main division of the project contains 525 farms, of which 483 were farmed during the calendar year 1933. The average value of crops was \$32.25 per acre, which is an increase of 100 percent over the previous year. On the Tule Lake division there were 334 farms, of

which 290 were operated by owners and 44 by tenants. Crop values on this division were \$30 per acre. This division has been opened to entry during the past few years, and the new settlers have had considerable difficulty in getting started on their farms because of the unusually low prices received for farm products. The Langell Valley, Horsefly, and Shasta View districts have had but little success in carrying on settlement activities. A supplemental contract has been signed by the Horsefly district which reduces its indebtedness to the United States by about \$30,000. The Langell Valley irrigation district has been trying for some time to obtain legislation authorizing the reclassification of the irrigable area and a reduction of its obligation to the United States. They have already obtained a revision of their repayment contract which provides a more favorable schedule of payments. Most of the farm products are sold through cooperative associations and with the prospect of increased prices in 1934 there is a more optimistic feeling on the project. Construction work was limited to some minor extensions of the drainage system on the Tule Lake division and the Klamath irrigation district.

OWYHEE PROJECT, OREGON-IDAHO

In August 1933 the Public Works Administration made an allotment of \$5,000,000 for continuing construction work on the Owyhee project and at the close of the year the work was 68 percent completed. During the fiscal year 1934 contracts were awarded which will complete the North Canal from the outlet of tunnel no. 1 to the inlet of the Malheur River siphon, a distance of 39 miles, and the Mitchell Butte lateral, 11½ miles in length. Satisfactory progress was made on all of the construction contracts. It is now expected that delivery of water to a portion of the new project lands can be made in the spring of 1935.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Production and general morale on the project continued to improve during the fiscal year, largely as a result of a prompt recovery of the sheep industry, with increased prices for fat lambs and wool. The 1933 crops reached a value of \$15.27 per acre, or an increase of about 20 percent over the previous year. The yields from sugar beets were disappointing owing principally to unfavorable spring weather and thin stands, making the average production on the project just under 9 tons per acre. The commissioners of the Federal Land Bank of Omaha commenced approval of loans on the project in 1933 and more than \$100,000 had been advanced at the close of the fiscal year. During 1933 there was not much change in settlement conditions, but the drought of 1934 has brought about a marked increase in the movement of settlers from marginal lands through the assistance of

the South Dakota Rural Rehabilitation Corporation. No construction work was in progress during the fiscal year.

HYRUM PROJECT, UTAH

This project will furnish a supplemental water supply to about 12,000 acres of land along the Little Bear River in the vicinity of Hyrum, Wellsville, and Mendon, which area now has an inadequate water supply. The land is all in private ownership and with a few exceptions the holdings are small. The principal industries include dairying and the production of sugar beets and vegetables. The community is well organized for the sale of farm products and their utilization through canneries, creameries, and beet-sugar factories. The Public Works Administration made an allotment of \$930,000 for the construction of Hyrum Dam and Reservoir and about 20 miles of canals. Contract for the construction of the dam was awarded to J. A. Terteling & Son of Spokane, Wash., and work has been in progress since the latter part of March. The location of canals and laterals has been completed and drawings and specifications covering this work are being prepared so that bids can be called for early in the fiscal year 1935.

MOON LAKE PROJECT, UTAH

The sum of \$1,500,000 was allotted to this project by the Public Works Administration in November 1933. The work contemplated involves the construction of an earth-fill dam at Moon Lake on one of the tributaries of the Colorado River. This dam will raise the water level of the lake about 56 feet and create a reservoir with a capacity of 30,000 acre-feet. A feeder canal about 6 miles long to the Uintah River is also contemplated. The lands to be benefited comprise 26,000 acres under existing canals diverting from Lake Fork and 14,000 acres under canals on the Uintah River. A draft of repayment contract has been prepared and is now under consideration.

OGDEN RIVER PROJECT, UTAH

An allotment of \$3,000,000 for the Ogden River project was granted by the Public Works Administration for the construction of Pine View Dam and Reservoir, a 75-inch wood-stave pipe from the dam to the mouth of Ogden Canyon, about 25 miles of canal extending north to Brigham City, and south for about 8 miles from the mouth of the canyon, which systems will distribute the stored water to lands that have heretofore had only a partial supply of water. Detailed engineering investigations were promptly started, and at the close of the fiscal year plans and specifications covering the construction of

Pine View Dam and appurtenant works had been completed and advertisement issued calling for bids to be opened September 5.

PROVO RIVER PROJECT, UTAH

This project has been given an allotment of \$2,700,000 for the construction of a storage dam and reservoir on the Provo River about 12 miles southwest of Heber. An earth-fill dam will raise the water surface about 175 feet giving a reservoir capacity of 145,000 acre-feet, which water will serve as a supplemental supply for the irrigation of 36,000 acres in Salt Lake Valley. An additional supply of water to fill this reservoir will be obtained by diverting a portion of the Weber River through the Weber-Provo Canal which is to be enlarged. The project also comprises the construction of levees across Goshen and Provo Bays in Utah Lake which will reduce the surface area and thereby effect a saving in evaporation losses on the lake. At the close of the fiscal year no construction work had been started but repayment contracts were being negotiated.

SANPETE PROJECT, UTAH

An allotment of \$300,000 was made for this project in November 1933. The work planned covers the construction of 2 tunnels, 1 on the Ephraim division about 7,200 feet long with a capacity of 100 cubic feet per second, with short feeder canals, and a second on the Spring City division. The two divisions have an area of 8,000 acres of land now under irrigation but with an inadequate supply of water. Repayment contracts were being negotiated and construction will begin early in the following fiscal year.

STRAWBERRY VALLEY PROJECT, UTAH

Economic conditions on the project are shaped by the 1934 general drought situation. There was sufficient water in storage at the beginning of the year to deliver 20 percent of the contract rights. With funds advanced by the Federal Emergency Relief Administration work was started on the excavation of the new outlet channel which will make it possible to recover an additional 18,000 acre-feet of storage in Strawberry Reservoir which added 10 percent to the contract rights. Investigations were also under way to determine the feasibility of diverting some small streams of water into the Strawberry Reservoir as the limited quantity available for 1934 makes it absolutely necessary to resort to every means possible to increase the quantity that can be used to save valuable crops.

Crop values for 1933 showed an average of \$19.18 per acre, which was an increase of only \$2 over the previous year. The project is

feeling the benefits of the various Federal relief programs aimed at the general improvement of social and business conditions on the project.

WEBER RIVER PROJECT, UTAH

Echo Reservoir, on the Weber River, with a capacity of 74,000 acre-feet, was constructed in 1930. A small quantity of water was stored in 1931, while in 1932 the reservoir was filled to nearly its capacity. This stored water furnished the necessary supplemental supply of water for the irrigation of 60,000 acres of land in the lower Weber and Ogden Valleys. The average value of crops for 1933 was approximately \$40 per acre. The dam and reservoir are operated by the Weber River Water Users Association. In 1934, with its low run-off on all streams in the Salt Lake Basin, Echo Reservoir filled to nearly half capacity. This quantity of water will be used with a maximum of efficiency to irrigate the valuable crops of fruits and vegetables that are produced on the lands of this project.

COLUMBIA BASIN PROJECT, WASHINGTON

The Public Works Administration has made an allotment of \$15,000,000 to carry on the construction of the Columbia Basin project, which comprises the Grand Coulee Dam and power plant located on the Columbia River about 75 miles west of Spokane, Wash. The estimated cost of the initial development is: Dam, \$42,000,000; power plant, \$21,000,000. The first development includes the construction of a concrete straight gravity dam about 300 feet in height with a crest length of 3,400 feet. The initial power development provides for the installation of three hydroelectric generators with a capacity of 35,000 kilovolt-amperes under the low dam. This initial development is for power purposes only. Eventually the dam is to be increased 200 feet in height, which will permit the construction of the Columbia Basin irrigation project, and with the increased height of dam the capacity of the generators will be increased to 105,000 kilovolt-amperes each.

An effort was made to get construction work under way at the earliest possible date and in December 1933 contract was awarded for the removal of the earth overburden at the two ends of the dam. Contract for construction of the dam was awarded to a combination of firms consisting of the Silas Mason Co., Walsh Construction Co., and Atkinson-Kier Co., these contractors having submitted a low bid of \$29,339,301. Other contracts have been awarded covering construction of railroad, highways, streets, and water and sewer systems for the construction camp, making a total of \$30,500,000.

OKANOGAN PROJECT, WASHINGTON

The project had the largest supply of gravity water during 1933 that it has had since 1921. Indications are that the gravity supply of water for 1934 will not, however, be in excess of 2 feet per acre. There was a slight increase in irrigated acreage during 1933. The project apple crop for the 1934 season will run from average to excellent with the assumption that returns will be far better than for the past year. Cherries for 1934 brought the growers a fairly good return. Pear harvest will start about the first week in August. With the exception of pears and cherries very little soft fruit is marketed. A total of \$3,859.95 was spent during the fiscal year in lining 2,040 linear feet of the Upper Main lateral. Approximately 9,100 linear feet of 4- to 12-inch pipe was installed in replacement of worn-out lines. Some half dozen old wooden weirs were replaced with concrete during the spring of 1934.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton divisions.—There was but little change in the irrigated area of these two divisions, but increased prices of farm products showed a gratifying increase over the low year of 1932, the average per-acre value for the Sunnyside division being \$39.15, and for the Tieton division, consisting principally of fruits, \$87.10. The water supply was ample for all requirements, and a very heavy flood which occurred in December 1933 insured a full supply of water for the season of 1934. The operation and maintenance of these two divisions of the project has continued under the Bureau of Reclamation. No construction work was in progress during the year.

Kittitas division.—Excellent progress was made during the year in the development of lands on this division. The area irrigated in 1933 was 44,578 acres. The principal crops are alfalfa hay, small grains, potatoes, and seed peas. The average per-acre value of crops produced was \$18.85. On February 16, 1933, 47 farm units were opened to entry and 25 more were opened under date of April 12, 1934. The number of applications received was in excess of the farms available, and entries were allowed on all of the lands with the exception of a very few small tracts that were not particularly desirable. The operation of the division was taken over by the Kittitas reclamation district at the beginning of the calendar year 1934. Construction work was limited to placing concrete lining in about 1,200 feet of the South Branch Canal and an extension of the Badger Creek wasteway.

Kennewick division.—Settlement on this division is progressing slowly. The area served by the pumping plant during 1934 included about 3,000 acres out of a total of about 4,000. An adjustment contract covering reduction of power rates for a period of 3 years has

been concluded, and these reduced rates have been extended to the Franklin County and Richland irrigation districts that also use power from the Prosser power plant. Construction work was limited to some miscellaneous improvements at the intake of the Prosser power plant.

Storage division.—The construction of Cle Elum Dam was completed September 5, 1933, at a cost of \$2,383,491. There remains to be built the parapet wall on top of the dam which will be delayed a year or more to await any possible settlement of the earthen embankment. Spillway gates will be installed when the need develops for full capacity of the reservoir. The estimated cost of these additional features is \$80,000.

CASPER-ALCOVA PROJECT, WYOMING

Construction of this project was approved in October 1933, and an allotment of \$12,000,000 made by the Public Works Administration. At the close of the fiscal year 3 of the 4½ miles of West Side Service Road to the Seminoe Dam site were completed. Approximately 50 acres of the Seminoe Reservoir area were cleared. All excavation on the Alcova diversion tunnel and outlet tower had been completed, and 1,467 cubic yards of concrete lining placed in the diversion tunnel. One hundred and seventy-five linear feet of canal tunnel excavation had been completed and 63,780 cubic yards of open canal excavated. The transmission line from Casper to the Seminoe Dam was approximately 50 percent complete, 32 miles of the line having been constructed to the Alcova Dam, and about 34½ miles of telephone line were constructed from the Pathfinder Dam, via Alcova, to a point approximately 4½ miles below the Seminoe Dam site. Future plans provide for the construction of the Seminoe storage dam and power system, the Alcova diversion dam, the lateral system and appurtenant structures, and the continuation of construction of the Casper Canal and appurtenant structures and the transmission line. Appropriations are available for continuation of this work.

RIVERTON PROJECT, WYOMING

In the fall of 1933 there were 73 settlers on the project and the area in cultivation had increased 60 percent over the previous year. Crops in 1934 are in excellent condition when it is considered that 40 percent of the land is in cultivation for the first time. Cash is still scarce but the settlers owe little and the general outlook is brighter. All water users have paid the advance water rental charge for the current season. A secondary highway was built into the project during the year and construction was begun on another. There is still room for additional settlers but they are now coming about as fast as they can be assimilated. No construction work was in progress during the fiscal year.

SHOSHONE PROJECT, WYOMING

The water supply on this project has been more than sufficient to meet all requirements and some water was sold to relieve an acute shortage on private irrigation projects in Montana. The average value of crops, \$16 per acre, has increased, but is still considerably below the 10-year average. Settlement activity on the Willwood division showed a decided increase over the previous years and the drought conditions that existed in 1934 have brought in a large number of settlers to look over the vacant farms on the Willwood division. The Associated Seed Growers have continued to operate a seed warehouse at Powell, which has given employment at cleaning seed peas and beans to about 25 during the winter months. A large portion of the crops and livestock products are sold through cooperative marketing associations. Construction work was limited to short extensions to the drainage system on the Willwood division and highway repairs to the power plant at Shoshone Dam.

SECONDARY INVESTIGATIONS

Federal funds for work done during the past fiscal year, as hereinafter described, were available from the acts of July 3, 1930; February 14, 1931; April 22, 1932; February 17, 1933; March 4, 1933; and June 16, 1933. Of \$234,931.52 disbursed by the Bureau during the past fiscal year, including \$35,233.97 for work under section 15 of the Boulder Canyon Project Act, and \$120,824.12 for investigations with funds allotted under the National Industrial Recovery Act, \$204,991.35 was provided by the United States. The projects investigated were Parker-Gila Valley in Arizona; All-American Canal and Sacramento and San Joaquin Valleys in California; Upper Snake River storage in Idaho; Frenchtown in Montana; Humboldt River in Nevada; Baker, Brogan, Deschutes, and Pendleton in Oregon; Moon Lake, Ouray Valley, Provo River, Sanpete, and Utah Lake in Utah; and North Platte River power in Wyoming.

Investigations under section 15 of the Boulder Canyon Project Act were carried on in the States of Colorado, New Mexico, Utah, and Wyoming.

TABLES

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1934*

DEBIT SIDE

Construction account:		
Primary projects:		
Cost of irrigation works:		
Original construction.....	\$205, 684, 205. 69	
Supplemental construction.....	12, 627, 449. 22	
Value of works taken over	2, 056, 939. 90	
	<hr/>	
Total construction cost.....		\$220, 368, 594. 81
Operation and maintenance prior to public notice (net).....	2, 804, 745. 00	
Operation and maintenance deficits and arrearages funded with construction.....	5, 260, 839. 85	
Penalties on water-right charges funded with construction.....	1, 696, 099. 49	
	<hr/>	9, 761, 684. 34
		<hr/>
		230, 130, 279. 15
Less (income items):		
Construction revenues.....	6, 590, 769. 67	
Contributed funds.....	1, 783, 013. 08	
Nonreimbursable appropriation (Rio Grande Dam).....	1, 000, 000. 00	
	<hr/>	9, 373, 782. 75
		<hr/>
		220, 756, 496. 40
Less:		
Abandoned works, nonreimbursable cost, and charge-offs.....		15, 615, 331. 70
		<hr/>
Balance payable.....		\$205, 141, 164. 70
Yuma auxiliary project:		
Cost of irrigation works.....	899, 837. 00	
Impounded funds, economy acts.....	504. 96	
	<hr/>	900, 341. 96
Less: Construction revenues.....		1, 085. 47
		<hr/>
		899, 256. 49
Palo Verde flood protection: Cost of reconstruction and repairs.....		48, 917. 67
Tennessee Valley Authority:		
Cost of designs.....		129, 874. 17
Less: Contributed funds.....		129, 874. 17
		<hr/>
Secondary projects and general investigations:		
Cost of surveys and investigations.....		3, 004, 965. 86
Less: Contributed funds.....		557, 371. 37
		<hr/>
		2, 447, 594. 49
General offices' expense undistributed.....		227, 037. 11
Plant and equipment.....		705, 651. 16
Materials and supplies.....		370, 287. 37
Accounts receivable:		
Current accounts.....		1, 160, 382. 86
Deferred accounts.....		154, 978, 178. 11
		<hr/>
		156, 138, 560. 97
Undistributed clearing cost accounts.....		39, 834. 19
Unadjusted debits: Disbursement vouchers in transit.....		36, 324. 63

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1934—Con.*

Cash:

Balance on hand:

Reclamation fund.....	\$4, 737, 153. 39
Yuma auxiliary fund.....	148, 253. 80
Special funds.....	119, 156. 25
National Industrial Recovery—Interior—Reclamation.....	56, 425, 099. 69
	<hr/>
	\$61, 429, 663. 13

In special deposit and in transit..... 28, 489. 83

\$61, 458, 152. 96

Total debits..... 427, 512, 781. 74

CREDIT SIDE

Security for repayment of cost of irrigation works:

Contracted construction repayments.....	197, 769, 670. 21
Yuma auxiliary contracted repayments.....	604, 885. 27

198, 374, 555. 48

Current accounts payable..... 831, 058. 83

Deferred and contingent obligations..... 1, 726, 831. 42

Reserves and undistributed profits..... 7, 565, 940. 86

Operation and maintenance results, surplus..... 642, 595. 53

Unadjusted credits: Collection vouchers in transit..... 275. 15

Government aid for reclamation of arid lands:

Reclamation fund..... 158, 021, 444. 37

Advances to reclamation fund:

Treasury loan (act of June 25, 1910).....	\$20, 000, 000. 00
Less: Amount repaid.....	10, 000, 000. 00

10, 000, 000. 00

Treasury loan (act of Mar. 4, 1931)..... 5, 000, 000. 00

15, 000, 000. 00

National Industrial Recovery—Interior—Reclamation..... 59, 435, 000. 00

Special funds:

Increase of compensation.....	2, 797, 960. 33
Rio Grande Dam.....	1, 000, 000. 00
Wind River Indian (Riverton).....	359, 176. 04
Judgments, United States courts.....	602, 814. 38
Drainage and cut-over lands.....	99, 815. 08
General investigations, 1923-Dec. 31, 1924.....	266, 352. 66
Arid, semiarid, swamp, and cut-over timberlands.....	35, 923. 75
Columbia Basin irrigation project.....	11, 634. 28
Colorado River levee system.....	445, 110. 59
Palo Verde flood protection.....	49, 369. 43

238, 124, 600. 91

Less: Nonreimbursable appropriation, Rio Grande Dam..... 1, 000, 000. 00

237, 124, 600. 91

Less: Impairment of funds:

Abandoned works.....	\$1, 346, 244. 64
Nonreimbursable construction cost.....	773, 296. 35
Operation and maintenance cost uncollectible.....	453, 272. 39
Charge-offs, act of May 25, 1926.....	14, 643, 981. 16
Washington office cost since Dec. 5, 1924.....	1, 288, 134. 70
Attendance at meetings, cost.....	1, 815. 90
Giving information to settlers, cost.....	2, 963. 88
Prepaid Civil Service retirement fund.....	2, 340. 33

18, 512, 049. 35

218, 612, 551. 56

Less: Impounded funds, economy acts, reclamation fund..... 241, 027. 09

218, 371, 524. 47

Total credits..... 427, 512, 781. 74

RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1934*

Items	Funds						
	Reclama- tion	Yuma auxiliary	Colorado River levee system	Palo Verde flood protec- tion	National Industrial Recovery Act	Ten- nessee Valley Author- ity	Colum- bia Basin project
Balance on hand, July 1, 1933.....	\$2, 775, 970. 40	\$155, 657. 79	\$110, 384. 10	\$6, 174. 51			
Receipts:							
Proceeds from sale of public lands.....	325, 210. 65						
Proceeds from oil leas- ing act.....	1, 649, 258. 92						
Proceeds from potassi- um royalties.....	50, 088. 98						
Proceeds from Federal power licenses.....	98, 450. 99						
From project collec- tions.....	2, 301, 853. 15	14, 181. 17	1. 45		\$14, 062. 84		\$81. 21
From general treasury.....					59, 435, 000. 00	\$175, 000	
Contributed funds.....							43, 481. 07
Total.....	7, 200, 833. 09	169, 838. 96	110, 385. 55	6, 174. 51	59, 449, 062. 84	175, 000	43, 562. 28
Expenditures:							
Disbursements.....	2, 326, 592. 66	21, 321. 77	51, 211. 84	5, 381. 88	3, 024, 094. 79	113, 933	42, 999. 29
Impounded funds, act of June 30, 1932.....	137, 087. 04	263. 39	2, 210. 42	229. 66			
Total.....	2, 463, 679. 70	21, 585. 16	53, 422. 26	5, 611. 54	3, 024, 094. 79	113, 933	42, 999. 29
Balance on hand June 30, 1934.....	4, 737, 153. 39	148, 253. 80	56, 963. 29	562. 97	56, 424, 968. 05	61, 067	562. 99

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Potassium royalties and rentals ¹	Total to June 30, 1934
	Fiscal year 1934	To June 30, 1934	Fiscal year 1934	To June 30, 1934		
Alabama.....			\$5, 549. 16	\$170, 094. 17		\$170, 094. 17
Arizona.....	\$30, 258. 35	\$2, 644, 609. 56		159. 86		2, 644, 769. 42
California.....	49, 156. 09	8, 129, 393. 10	902, 282. 06	10, 357, 295. 94	\$150, 055. 35	18, 636, 744. 39
Colorado.....	23, 979. 70	10, 232, 224. 85	26, 343. 83	457, 212. 32		10, 689, 437. 17
Idaho.....	16, 976. 58	6, 987, 907. 29	1, 948. 61	14, 215. 25		7, 002, 122. 54
Kansas.....	158. 01	1, 032, 922. 49				1, 032, 922. 49
Louisiana.....			7, 022. 76	34, 593. 92		34, 593. 92
Montana.....	32, 786. 45	15, 284, 249. 36	31, 201. 75	1, 058, 681. 33		16, 342, 930. 69
Nebraska.....	² 293. 36	2, 095, 093. 21				2, 095, 093. 21
Nevada.....	³ 2, 101. 99	1, 020, 944. 54	84. 00	4, 943. 37		1, 025, 887. 91
New Mexico.....	68, 156. 33	6, 561, 148. 29	84, 877. 49	420, 809. 46		6, 981, 957. 75
North Dakota.....	658. 66	12, 217, 303. 42	9, 261. 88	117, 659. 93		12, 334, 963. 35
Oklahoma.....	1, 034. 39	5, 928, 212. 41				5, 928, 212. 41
Oregon.....	11, 034. 45	11, 951, 265. 07	1. 54	11. 79		11, 951, 276. 86
South Dakota.....	1, 744. 93	7, 726, 220. 73	230. 53	1, 378. 08		7, 727, 598. 81
Utah.....	16, 014. 26	4, 214, 409. 52	35, 596. 56	390, 370. 84		4, 604, 780. 36
Washington.....	3, 371. 30	7, 440, 068. 45	5, 208. 58	33, 220. 46		7, 473, 288. 91
Wyoming.....	72, 376. 50	8, 541, 375. 13	539, 650. 17	32, 236, 408. 63		40, 777, 783. 76
Total.....	325, 310. 65	112, 007, 347. 42	1, 649, 258. 92	45, 297, 055. 35	150, 055. 35	157, 454, 458. 12
Proceeds, Federal water power licenses.....						² 566, 986. 25
Grand total.....						158, 021, 444. 37

¹ Proceeds for fiscal year, \$50,088.98.² Contra.³ Proceeds for fiscal year, \$98,450.99.

RECLAMATION TABLE 4.—*Consolidated statement by projects, of construction cost of irrigation works, other items reimbursable with construction, and amounts repayable*

State and project	Construction cost		Operation and maintenance before public notice (net)		Operation and maintenance deficits and arrearages and penalties		Construction revenues, contributed funds, and non-reimbursable appropriation (contra)		Abandoned works, non-reimbursable cost, and authorized charge-offs	Total repayable	
	Fiscal year, 1934	To June 30, 1934	Fiscal year, 1934	To June 30, 1934	Fiscal year, 1934	To June 30, 1934	Fiscal year, 1934	To June 30, 1934		Fiscal year, 1934	To June 30, 1934
Arizona:											
Salt River		\$12,744,222.59		\$115,993.50	\$43,428.40	\$43,428.40		\$2,312,096.81	\$382,097.31	\$43,428.40	\$10,209,450.37
Verde	\$59,765.47	59,765.47								59,765.47	59,765.47
Arizona-California: Yuma	21,169.72	9,397,900.43		378,083.73	104,758.40	104,758.40	\$1,286.33	227,128.44		97,310.63	9,653,014.12
California: Orland	985.15	2,400,288.08		\$11,432.99	4,420.77	5,130.48	10.89	28,414.77		5,395.03	2,365,570.80
Colorado:											
Grand Valley	2,122.94	5,017,465.36		138,621.28	4,249.44	4,249.44	1,000.00	269,692.83	812,374.64	5,372.38	4,078,268.61
Uncompahgre		6,422,627.88		311,103.02	186,197.53	186,197.53	2.90	24,241.62	1,260,791.93	\$2.90	5,634,894.88
Idaho:											
Boise		16,010,350.03		422,283.48	47,781.46	927,297.22	38,448.88	495,124.99	82,393.84	9,332.58	16,782,411.90
King Hill		1,905,918.80				110,122.51		28,187.27	497,464.06		1,490,389.98
Minidoka	61,470.34	15,078,679.66		319,808.98	16,057.08	522,786.66		2,023,126.88	2,288.15	119,421.30	13,895,860.27
Minidoka-Gooding	49,874.18	4,172,262.10			12,607.43	69,021.60		2,172.38		62,481.61	4,239,111.12
Kansas: Garden City		342,963.68		52,868.10				61,356.82	334,474.96		
Montana:											
Bitter Root	90,000.00	717,641.05								90,000.00	717,641.05
Huntley		1,562,302.99			19.33	387,993.95				19.33	1,868,875.04
Milk River	24,626.74	6,868,744.89			668.41	101,062.03				21,278.45	5,596,830.54
Sun River	87,862.55	7,471,864.86			935.11	103,853.45	136.00	47,535.69		88,606.01	7,572,046.25
Montana - North Dakota:											
Lower Yellowstone		3,685,433.14		\$422.10	10,026.40	915,742.90		53,532.47	382,254.00	9,604.30	4,161,208.67
Nebraska - Wyoming: North Platte	37,669.85	19,267,634.53		743,294.42	10,885.65	1,517,431.11	56,759.82	554,661.34		28,204.32	20,973,698.72
Nevada: Newlands		7,956,907.07		\$2,155.44	8,461.41	43,092.61		52,347.53	4,437,820.00	8,461.41	3,507,676.71
New Mexico:											
Carlsbad		1,464,649.87		\$17,751.77	59,937.02	64,768.91	18.42	29,077.21	374,883.58	59,918.60	1,107,706.22
Hondo		339,491.68		32,952.01				656.03	371,787.66		
New Mexico-Texas: Rio Grande	55,061.04	15,131,134.43		\$297,857.81	38,493.60	38,493.60		1,408,881.64	326,900.97	93,554.64	13,135,987.61
North Dakota:											
Belmont-Trenton		223,423.06		\$31.75				1,967.62	221,423.69		
Williston		517,630.09		\$165.00			1,800.00	98,906.76	418,558.33		
Oregon:											
Baker		281,591.64			173.09	173.09		5,003.00		173.09	276,761.73
Deschutes		5,361.52								5,361.52	5,361.52
Stanfield	31,693.77	31,693.77								31,693.77	31,693.77

Umatilla-----	5,137,937.20	108.46	230,536.78	85,646.38	888,340.82	\$ 216.68	4,394,486.78
Vale-----	3,661,102.55	39,048.70	-----	2,019.47	-----	188,353.95	3,692,066.78
Oregon-California: Klamath-----	6,266,045.47	83,244.37	86,086.56	5,990.61	7,499.72	44,986.51	6,205,532.83
Oregon-Idaho: Owyhee-----	12,248,374.15	336.00	-----	24.96	-----	1,011,045.13	12,244,317.22
South Dakota: Belle Fourche-----	4,521,625.11	1,989.03	10,255.46	1,063.68	379,031.58	13,673.56	4,795,716.13
Utah:-----	-----	-----	-----	-----	-----	-----	-----
Hyrum-----	172,748.02	-----	-----	-----	-----	172,748.02	172,748.02
Salt Lake Basin-----	2,914,526.98	4,870.82	4,870.82	29.67	45,910.77	6,586.69	2,873,487.03
Strawberry Valley-----	3,507,423.49	6,293.51	89,046.89	-----	258,379.12	6,293.51	3,348,835.32
Washington:-----	-----	10,744.06	-----	-----	-----	-----	-----
Grand Coulee-----	811,142.22	-----	-----	50,842.80	760,299.42	760,299.42	760,299.42
Okanogan-----	1,452,129.45	247,766.87	25,194.37	6,630.78	998,727.20	424,198.97	424,198.97
Yakima ¹ -----	213,129.50	2,64,357.08	135,790.36	38,925.72	4,214.60	192,428.49	25,713,769.49
Wyoming:-----	-----	-----	-----	-----	-----	-----	-----
Casper-Alcova-----	612,398.50	-----	-----	3.00	-----	612,395.50	612,395.50
Riverton-----	5,000.00	14,392.25	89,765.74	796.00	-----	18,596.25	3,964,059.81
Shoshone-----	6,018.51	3,746.20	470,778.12	17,240.72	1,544,771.05	\$ 5,129.21	8,574,443.63
Total-----	3,583,849.86	2,804,745.00	399,023.32	6,956,872.42	171,969.60	3,825,032.44	205,141,122.28

¹ NOTE:

Abandoned works:

Garden City-----	\$334,474.96
Hondo-----	371,787.66
Buiford-Trenton-----	221,423.69
Williston-----	418,558.33
-----	-----
-----	1,346,244.64
-----	-----
Non-reimbursable cost: Salt River-----	382,097.31

² Contra.³ Yakima-Kittitas combined with Yakima in this report.

Authorized charge-offs, act of May 25, 1926--Continued.

Sun River-----	\$812,374.64
Lower Yellowstone-----	1,260,791.93
Newlands-----	82,393.84
Carlsbad-----	497,464.06
Rio Grande-----	2,288.15
Umatilla-----	62,049.83
Klamath-----	1,735,969.31

Authorized charge-offs, act of May 25, 1926--Continued.

Belle Fourche-----	\$89,214.47
Okanogan-----	382,254.00
Yakima-----	4,437,820.00
Shoshone-----	374,883.68
-----	326,900.97
-----	888,340.82
-----	7,499.72

13,886,989.75

RECLAMATION TABLE 5.—Accounts receivable, construction water-right charges (including contributed funds)

State and project	Due		Collected			Uncollected June 30, 1934
	Fiscal year 1934	To June 30, 1934	Cash		Other credits to June 30, 1934	
			Fiscal year 1934	To June 30, 1934		
Arizona:						
Salt River.....	¹ \$762,451.64	\$6,506,254.09	¹ \$609,961.32	\$6,506,254.09		
Yuma auxiliary.....	¹ 995.99	593,945.51	¹ 492.28	588,374.23	\$1,584.05	\$3,987.23
Arizona-California: Yuma.....	¹ 9,553.79	3,902,932.76	¹ 41,886.56	3,379,485.78	513,286.78	10,160.20
California: Orland.....	¹ 20,553.63	803,575.12	¹ 9,574.43	773,323.28		30,251.84
Colorado:						
Grand Valley.....	4,025.00	360,893.50	1,000.00	291,229.94	69,663.56	
Uncompahgre.....	90,284.04	670,681.20		427,247.72	62,865.05	180,568.43
Idaho:						
Boise.....	¹ 17,203.33	4,000,902.55	¹ 16,926.41	3,973,709.26	27,193.29	
King Hill.....	8,000.00	90,825.66		8,025.66		82,800.00
Minidoka.....	74,646.69	8,434,674.73	34,806.61	7,775,555.99	642,648.90	16,469.84
Minidoka-Gooding.....		280,798.48		280,798.48		
Montana:						
Huntley.....	1,018.08	558,699.75	985.18	467,990.30	90,630.24	79.21
Milk River.....	8,990.00	58,322.76		3,002.76		55,320.00
Sun River.....	1,326.60	209,279.14	1,740.00	206,233.59	3,045.55	
Montana-North Dakota:						
Lower Yellowstone.....	1,634.24	290,497.13	1,321.81	290,184.70	312.43	
Nebraska-Wyoming: North Platte.....	173,310.57	3,877,350.28	15,484.19	2,809,327.94	1,012,579.58	55,442.76
Nevada: Newlands.....	8,456.56	1,155,761.92	6,075.74	1,093,066.50	61,855.96	839.46
New Mexico: Carlsbad.....	1,602.25	892,951.77	1,726.61	892,797.26	81.25	73.26
New Mexico-Texas: Rio Grande.....	¹ 73,446.75	3,463,449.45		3,151,777.81	311,671.64	
Oregon:						
Baker.....		5,000.00		5,000.00		
Umatilla.....	625.59	539,141.38	270.55	398,461.69	5,190.89	135,488.80
Vale.....		5,000.00		5,000.00		
Oregon-California: Klamath.....	¹ 2,673.59	1,115,030.62	1,029.26	1,112,569.69	1,445.87	1,015.06
Oregon-Idaho: Owyhee.....		4,354.61		4,354.61		
South Dakota: Belle Fourche.....	¹ 741.29	629,309.91	¹ 1,539.68	551,035.86	78,274.05	
Utah:						
Salt Lake Basin.....	208.50	44,965.27	208.50	44,965.27		
Strawberry Valley.....	¹ 26,531.17	1,287,430.30	¹ 21,312.53	1,277,677.55	9,752.75	
Washington:						
Okanogan.....	10,425.94	172,495.21	425.94	134,223.98		38,271.23
Yakima ⁴	¹ 252,812.59	6,656,606.08	17,343.33	6,604,553.01	36,363.75	15,689.32
Wyoming: Shoshone.....	342.60	827,834.51	564.92	821,367.82	6,074.33	392.36
Total.....	¹ 782,067.11	47,438,963.69	¹ 618,710.57	43,877,594.77	² 2,934,519.92	626,849.00
Paid in advance of due dates.....			732,217.92	1,144,621.71	³ 206,768.86	
Refunds.....				98,591.20	3,212.84	
Total collections.....			113,507.35	45,120,807.68		

¹ Contra.² Other credits for fiscal year, \$299,260.54.³ Increase for fiscal year, \$68,424.37.⁴ Yakima-Kittitas combined with Yakima in this report

RECLAMATION TABLE 6.—*Accounts receivable, operation, and maintenance charges (after public notice)*

State and project	Due		Collected			Uncollected June 30, 1934
	Fiscal year 1934	To June 30, 1934	Cash		Other credits to June 30, 1934	
			Fiscal year 1934	To June 30, 1934		
Arizona: Yuma auxiliary-----	\$18, 104. 92	\$453, 254. 00	\$15, 320. 04	\$424, 460. 64	\$13, 283. 75	\$15, 509. 61
Arizona-California: Yuma-----	95, 611. 62	3, 666, 562. 84	79, 120. 36	3, 454, 491. 04	176, 834. 95	35, 236. 85
California: Orland-----	36, 103. 55	601, 107. 32	34, 176. 63	544, 721. 59	23, 216. 61	33, 169. 12
Colorado:						
Grand Valley-----	44, 057. 71	308, 672. 85	38, 427. 52	296, 557. 55	9, 000. 00	3, 115. 30
Uncompahgre-----		1, 008, 683. 69		977, 809. 79	30, 873. 90	
Idaho:						
Boise-----	10, 948. 69	2, 159, 891. 60	11, 282. 59	2, 107, 241. 88	52, 649. 72	
King Hill-----		60, 711. 27		59, 192. 22	1, 519. 05	
Minidoka-----	40, 676. 50	2, 015, 787. 72	36, 462. 61	1, 902, 930. 54	112, 857. 18	
Minidoka-Gooding-----	2, 065. 85	6, 923. 40	1 287. 09	4, 570. 46	2, 352. 94	
Montana:						
Huntley-----		554, 787. 34		543, 594. 31	11, 193. 03	
Milk River-----	36, 259. 47	297, 463. 58	35, 299. 87	271, 483. 36	1, 662. 25	24, 317. 97
Sun River-----	1 181. 82	166, 318. 50		161, 966. 28	4, 352. 22	
Montana-North Dakota: Lower Yellowstone-----	531. 00	340, 483. 99	531. 00	340, 479. 36	4. 63	
Nebraska-Wyoming: North Platte-----	17, 012. 22	1, 892, 392. 62	18, 303. 24	1, 822, 212. 68	62, 850. 16	7, 329. 78
Nevada: Newlands-----		1, 174, 581. 57		1, 135, 901. 55	38, 680. 02	
New Mexico: Carlsbad-----	23, 103. 01	897, 486. 32	23, 184. 61	880, 565. 61	16, 872. 71	48. 00
New Mexico-Texas: Rio Grande-----	247, 618. 52	3, 785, 589. 34	298, 330. 61	3, 524, 584. 83	227, 923. 61	33, 080. 90
North Dakota:						
Buford-Trenton-----		2, 317. 41		2, 317. 41		
Williston-----		34, 042. 75		34, 042. 75		
Oregon:						
Umatilla-----	3, 209. 87	382, 495. 32	4, 689. 81	375, 241. 36	7, 253. 96	
Vale-----	8, 500. 00	8, 500. 00	4, 250. 00	4, 250. 00		4, 250. 00
Oregon-California: Klamath-----	47, 595. 16	1, 239, 757. 12	47, 394. 48	1, 205, 309. 45	30, 536. 22	3, 911. 45
South Dakota: Belle Fourche-----	59, 534. 17	1, 064, 809. 36	59, 534. 17	1, 055, 433. 37	9, 375. 99	
Utah: Strawberry Valley-----		376, 880. 88		365, 022. 21	11, 858. 67	
Washington:						
Okanogan-----		371, 441. 72		368, 788. 67	2, 653. 05	
Yakima 1-----	187, 362. 33	5, 162, 419. 02	316, 612. 77	4, 977, 339. 12	62, 308. 77	122, 771. 13
Wyoming: Shoshone-----	2, 842. 78	551, 644. 51	2, 906. 63	526, 957. 56	23, 705. 43	981. 52
Total-----	880, 955. 55	28, 585, 006. 04	1, 025, 539. 85	27, 367, 465. 59	933, 818. 82	283, 721. 63
Paid in advance of due dates-----			51, 584. 41	69, 621. 89	16. 53	
Penalties and interest-----			16, 410. 14	505, 515. 10	4 20, 880. 00	
Refunds-----			1, 678. 71	38, 228. 87	156. 09	
Total collections-----			1, 095, 213. 11	27, 980, 831. 45		

1 Contra.

2 Yakima-Kittitas combined with Yakima in this report.

3 Other credits for fiscal year, \$28,539.59.

4 Increase for fiscal year, \$400.

RECLAMATION TABLE 7.—*Accounts receivable, rental of irrigation water*

State and project	Due		Collected			Uncollected June 30, 1934
	Fiscal year 1934	To June 30, 1934	Cash		Other credits to June 30, 1934	
			Fiscal year 1934	To June 30, 1934		
Arizona:						
Salt River.....		\$2,246,726.01		\$2,246,726.01		
Yuma auxiliary.....	\$1,243.20	11,448.39	\$1,205.20	11,203.39		\$245.00
Arizona-California: Yuma.....	12,005.22	538,161.88	12,382.70	524,690.70	\$12,654.19	816.99
California: Orland.....	13.55	121,450.85	13.55	121,450.85		
Colorado:						
Grand Valley.....	10,897.60	501,016.68	7,365.99	487,833.18	6,500.67	6,682.83
Uncompahgre.....	1,945.47	1,223,133.55	287.05	1,218,374.56		4,758.99
Idaho:						
Boise.....	8,050.00	789,938.57	8,050.00	785,218.07	4,720.50	
Minidoka.....	51,335.65	607,776.44	51,274.15	604,338.43	3,383.01	55.00
Minidoka-Gooding.....		13,796.00	8,860.67	13,796.00		
Montana:						
Huntley.....	536.42	11,242.84	536.42	11,242.84		
Milk River.....	704.00	238,023.57	704.00	227,676.79	1,208.14	9,138.64
Sun River.....	55.65	132,243.21	147.51	129,535.67	1,366.62	1,340.92
Montana-North Dakota: Lower Yellowstone.....	422.10	135,473.18	303.48	135,345.38		127.80
Nebraska-Wyoming: North Platte.....	2,551.00	344,079.79	2,560.00	344,069.79	10.00	
Nevada: Newlands.....		28,291.16		22,114.31	6,176.85	
New Mexico:						
Carlsbad.....	400.00	39,824.83	400.00	39,807.58		17.25
Hondo.....		9,129.70		9,129.70		
New Mexico-Texas: Rio Grande.....	7,024.47	1,459,625.48	14,963.97	1,449,893.48		9,732.00
North Dakota:						
Buford, Trenton.....		31.75		31.75		
Williston.....		2,117.28		2,117.28		
Oregon:						
Umatilla.....	753.70	95,656.52	753.70	69,379.72		26,276.80
Vale.....	1,196.84	22,234.01	3,388.76	19,495.97		2,738.04
Oregon-California: Klamath.....	38,947.35	309,475.94	38,623.65	302,857.88	25.00	6,593.06
South Dakota: Belle Fourche.....	368.90	9,423.38	368.90	9,405.58	17.80	
Utah: Strawberry Valley.....		17,596.13		17,596.13		
Washington:						
Okanogan.....		110,645.28		108,061.09	2,584.19	
Yakima.....	2,313.85	181,071.38	2,659.65	171,491.88		9,579.50
Wyoming:						
Riverton.....	7,659.42	23,952.91	7,361.27	21,100.69	2,812.22	40.00
Shoshone.....	7,332.30	76,521.90	7,095.35	75,158.18	312.25	1,051.47
Total.....	155,756.69	9,300,108.61	169,305.97	9,179,142.88	141,771.44	79,194.29

¹ Other credits for fiscal year, \$336.56.

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1934*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102 Fixed capital under construction.....	\$61,772,209.13
103 Other physical properties.....	1,276,027.14
104 Investigations:	
Colorado River Basin.....	191,138.36
Parker-Gila project.....	30,070.97
105 Other capital expenditures: Interest during construction.....	3,475,599.26
Total investments (schedule 2).....	\$66,745,014.86

II. CURRENT AND ACCRUED ASSETS

121 Treasury cash:	
For advances to Colorado River Dam fund.....	36,601,438.04
Colorado River Dam fund.....	149,085.58
N.I.R.A.: Parker-Gila project.....	40,000.00
Collections in transit.....	6,954.24
Total Treasury cash (schedule 1).....	36,797,477.86

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project,
June 30, 1934*—Continued

II. CURRENT AND ACCRUED ASSETS—continued

122	Special fiscal agents' cash (schedule 1).....	\$111, 441. 60
123	Special deposits.....	4, 817. 75
124	Accounts receivable.....	85, 526. 65
Total current and accrued assets.....		\$36, 999, 263. 86

III. DEFERRED AND UNADJUSTED DEBITS

141	Clearing and apportionment accounts.....	* 62, 603. 71
143	Field cost adjustments.....	21, 730. 79
145	Jobbing accounts.....	1, 033. 81
146	Prepayments.....	5, 998. 83
171	Unadjusted debits.....	381, 194. 57
Total deferred and unadjusted debits.....		347, 354. 29
Total assets and other debits.....		104, 091, 663. 01

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205.1	Long-term liability: U.S. Treasury authorized appropriation.....	126, 500, 000. 00
161	Less: Authorized but not appropriated.....	31, 840, 000. 00
Total long-term liability:		
205.2	Appropriated but not advanced.....	36, 601, 438. 04
205.3	Appropriated and advanced.....	58, 058, 561. 96
205.4	Impounded Legislative Economy Act.....	* 137, 653. 66
206	N.I.R.A. allotment: Parker-Gila project.....	100, 000. 00
		94, 622, 346. 34

XI. CURRENT AND ACCRUED LIABILITIES

211	Audited accounts payable:	
211.1	Contractors' earnings: Current.....	1, 501, 427. 18
211.11	Contractors' earnings: Holdback.....	2, 679, 560. 48
211.2	Labor.....	45, 509. 78
211.3	Purchases.....	391, 585. 85
211.4	Freight and express.....	1, 025, 326. 68
211.5	Passenger fares.....	1, 362. 18
211.6	Right of way purchases.....	11, 600. 00
Total audited accounts payable.....		5, 656, 372. 15
214	Matured interest.....	3, 449, 967. 68
220	Consumers' motor deposits.....	20. 00
Total current and accrued liabilities.....		9, 106, 359. 83

XII. DEFERRED AND UNADJUSTED CREDITS

224	Undistributed income items.....	10, 130. 79
223	Special deposits.....	4, 817. 75
226	Contributions in aid of construction.....	21, 201. 07
231	Unadjusted credits.....	5, 713. 68
Total deferred and unadjusted credits.....		41, 863. 29

XV. APPROPRIATED SURPLUS

251	Appropriated surplus not specifically invested.....	321, 093. 55
Total liabilities and other credits.....		104, 091, 663. 01

* Contra.

RECLAMATION TABLE 9.—*Appropriations and cash statement, Boulder Canyon Project, June 30, 1934*

TREASURY CASH

	Appropriations	N.I.R.A. allotments	Total	Contributed funds Parker Dam	N.I.R.A. allotments Parker-Gila project
Appropriations, allotments and contributed funds.....	\$56,660,000.00	\$38,000,000.00	\$94,660,000.00	\$54,000.00	\$100,000.00
Advances to Colorado River Dam fund.....	46,608,358.70	11,450,203.26	58,058,561.96		
Balance not advanced.....	10,051,641.30	26,549,796.74	36,601,438.04		
Colorado River Dam fund:					
Advanced from appropriation to fund.....	46,608,358.70	11,450,203.26	58,058,561.96		
Collections deposited in fund.....	188,888.36	7,644.50	196,532.86		
Total advances and collections.....	46,797,247.06	11,457,847.76	58,255,094.82		
Disbursements by General Accounting Office.....	4,710,636.06	10,212.47	4,720,848.53		
Advances to special fiscal agents.....	41,949,786.68	11,435,358.10	53,385,144.78	54,000.00	60,000.00
Total withdrawals.....	46,660,422.74	11,445,570.57	58,105,993.31		
Balance.....	136,824.32	12,277.19	149,101.51		40,000.00
Repay collections in transit.....		11.50	11.50	115.00	
Miscellaneous collections in transit.....	6,811.81		6,811.81		
Total treasury cash (C. L. 121).....	10,195,277.43	26,562,085.43	36,757,362.86	115.00	40,000.00

SPECIAL FISCAL AGENTS' CASH

Advanced to special fiscal agents.....	\$41,949,786.68	\$11,435,358.10	\$53,385,144.78	\$54,000.00	\$60,000.00
Appropriation transfer adjustments (credit).....	10,431.32	2,481.65	12,912.97		
Disbursements by fiscal agents.....	41,960,218.00	11,388,238.95	53,348,456.95	27,733.91	25,737.48
Fiscal agents' checking balance.....		49,600.80	49,600.80	26,266.09	34,262.52
Collections by fiscal agents.....	199,679.77	10,137.65	209,817.42	54,240.00	
Collections deposited by fiscal agents.....	188,061.26	7,656.00	195,717.26	54,115.00	
Collections (appropriation transfer adjustments).....	10,431.32	2,481.65	12,912.97		
Collections not deposited.....	1,187.19		1,187.19	125.00	
Special fiscal agents' cash balance.....	1,187.19	49,600.80	50,787.99	26,391.09	34,262.52

SUMMARIES OF BUREAU REPORTS

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State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts				
	Irrigable acreage ²	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River.....	245,648	242,100	222,947	\$12,393,212	\$55.60	94,100	43,423	43,423	\$953,000	\$22.00
Arizona-California: Yuma.....	65,626	49,476	47,591	1,488,838	31.30	200	170	161	18,392	114.52
Valley division.....	49,522	41,019	39,411	1,175,471	30.00					
Reservation division (Indian).....	8,220	3,259	3,156	60,953	20.59					
Bard division (White).....	5,904	4,058	3,919	89,685	22.90					
Yuma auxiliary (Mesa).....	1,980	1,240	1,105	162,729	148.00					
California: Orland.....	20,634	13,946	13,380	400,476	29.93					
Colorado: Grand Valley.....	30,380	15,378	15,175	329,972	21.75	18,400	13,855	13,655	382,340	28.00
Uncompahgre.....	75,654	60,024	59,919	1,320,129	22.03	1,650	1,550	1,545	46,350	30.00
Idaho: Boise.....	167,776	156,422	156,301	2,967,366	18.98	144,068	131,293	126,617	2,472,700	19.28
New York Irrigation District.....	17,000	15,688	15,645	206,002	13.17					
Nampa-Meridian Irrigation District.....	38,192	36,851	36,801	649,125	17.64					
Boise-Kuna Irrigation District.....	47,646	45,266	45,238	737,863	16.31					
Wildor Irrigation District.....	56,338	50,917	50,917	1,195,040	23.47					
Big Bend Irrigation District.....	1,718	1,345	1,345	20,611	15.32					
Black Canyon Irrigation District.....	6,882	6,355	6,355	188,725	24.98					
King Hill.....	8,269	7,293	7,137	120,343	16.85					
Minidoka.....	116,054	104,486	98,387	2,914,925	29.65					
Minidoka Irrigation District.....	68,117	59,137	56,455	1,550,054	27.60	725,662	643,783	616,572	16,386,132	26.60
Burley Irrigation District.....	47,937	45,349	42,132	1,364,871	32.40					
Montana: Bitter Root Irrigation District.....	18,083	15,294	14,970	235,232	15.70					
Huntley.....	27,947	24,369	24,369	734,189	30.12					
Milk River.....	134,657	46,346	46,346	903,572	19.60					
Malta division.....	56,652	17,606	17,606	308,734	17.50					
Glasgow division.....	22,133	3,482	3,482	45,372	8.30					
Chinook division.....	55,772	23,258	23,258	553,466	23.90					
Sun River.....	56,721	40,734	42,027	306,650	7.30					
Fort Shaw division.....	9,257	7,374	7,416	87,857	11.80					
Greenfields and Big Coulee division.....	47,464	33,360	34,611	218,793	6.30					

¹ Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year" October 1932 to September 1933.² Areas for which Bureau was prepared to supply water in 1933.

RECLAMATION TABLE No. 10.—*Irrigation and crop results on Government projects, 1933—Continued*

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Montana-North Dakota:										
Lower Yellowstone.....	46,279	33,902	33,902	\$1,030,058	\$30.40					
District no. 1.....	31,789	23,247	23,247	713,052	30.70					
District no. 2.....	14,490	10,655	10,655	317,006	29.70					
Nebraska-Wyoming:										
North Platte.....	234,609	194,451	182,504	4,750,803	26.08	127,630	108,280	104,330	\$2,397,340	\$22.98
Panhandle Irrigation District.....	112,169	81,887	81,446	1,952,756	24.00					
Gardner and Fort Laramie Irrigation District.....	54,827	52,356	50,471	1,650,594	32.70					
Goshute Irrigation District.....	51,443	47,013	38,274	1,008,074	26.30					
Northport Irrigation District.....	16,170	13,245	12,313	148,379	12.10					
Nevada: Newlands.....	87,500	53,324	50,808	621,284	12.23					
New Mexico: Carlsbad.....	25,055	24,624	18,761	891,044	47.49					
New Mexico-Texas:										
Rio Grande.....	155,000	139,206	136,509	6,148,085	45.04	77,000	43,862	43,862	1,174,337	26.77
Elephant Butte Irrigation District.....	88,000	79,557	77,095	3,244,001	41.60					
Kit Carson Valley, N. Mex.....	16,000	12,283	11,807	316,298	26.80					
Mesilla Valley, N. Mex.....	72,000	67,274	66,188	2,927,703	44.20					
El Paso County Water Improvement District No. 1.....	67,000	59,649	58,514	2,904,084	49.60					
Mesilla Valley, Tex.....	56,000	49,787	48,870	474,004	49.20					
El Paso Valley, Tex.....	11,000	49,862	48,870	2,430,080	49.70					
Oregon: Baker.....	7,124	6,303	6,282	71,294	11.34					
Umatilla.....	13,444	11,342	10,984	173,011	15.84	729	691	671	15,528	23.60
East division.....	7,964	7,240	6,956	108,076	15.50					
West division.....	5,480	4,102	4,008	64,935	16.20					
Vale.....	15,854	4,982	4,051	91,958	22.53					
Oregon-California:										
Klamath.....	61,262	51,963	51,355	1,607,693	31.10	64,813	32,930	32,930	788,888	23.60
Main division.....	20,219	32,293	31,917	1,020,988	32.25					
Tule Lake division.....	20,213	19,670	19,498	586,645	30.03					
South Dakota: Belle Fourche.....	61,030	42,060	47,379	723,580	15.27					
Utah:										
Salt Lake Basin.....						87,754	87,753	83,954	3,349,381	38.90
Strawberry Valley.....	42,055	39,269	37,898	725,856	19.18	5,207	4,970	4,936	112,409	22.77
High line division.....	18,863	17,753	16,717	224,315	13.40					
Spanish Fork division.....	14,083	13,029	12,655	174,926	21.70					
Springville-Mapleton division.....	9,079	8,487	8,466	226,615	26.80					

GENERAL LAND OFFICE

(FRED W. JOHNSON, Commissioner)

The General Land Office was charged by Congress on April 25, 1812, with the survey and disposal of the public land. Historically and actually, it is the legal, title, and record bureau for the lands of the Federal Government. It collaborates closely with seven interdependent bureaus having to do with public land withdrawn for national forests, parks, mineral resources, reclamation, water power, wildlife, and the Indians. It adjudicates all public land and mineral land questions within withdrawals, forests, and other reservations. During the fiscal year there were noted on the public-land tract books 683 orders of a withdrawal or restoration nature varying in size from a single tract to more than a million acres.

The General Land Office maintains 25 district land offices in the western public land States and Alaska for the convenience of the public. Entries in States without district land offices are made directly in this office. The surveying and mapping is conducted by the Cadastral Engineering Service under a supervisor of surveys at Denver, Colo., an associate supervisor of surveys at Washington, and eight district Cadastral engineers. Twelve public survey offices contain the local survey records for public use.

The General Land Office is a hall of records on the disposition of the public domain—76 percent of the United States proper. Its 4,300 tract books contain the base title record and status of every 40-acre tract from the Ohio to the Golden Gate and from Canada to Texas, the Gulf, and Old Mexico. They are the index to 8,772,793 original record files. Additional are 7,392,345 files of letters, withdrawals, and miscellaneous actions and 11,880,780 index cards. Copies of the 6,056,146 patents are bound in 9,400 volumes. The base of the survey records is 6,099 volumes of field notes and approximately 100,000 township plats. The photo-lithographic copies of the plats, and to a lesser extent the field notes, are in demand by private parties and the public authorities for areas up to counties and entire States. During the fiscal year there were sold 7,060 plats for \$3,530 and 5,761 were disposed of officially. The public survey offices were paid \$2,322.40 for copies of records. The General Land Office received during the year 24,832 letters regarding old records and patents. There were furnished 63,382 certified copies at a charge of \$18,033.30, and 25,355 uncertified copies for official use. A large part of this business was due to farm loans and transfers requiring a perfect chain of title on the county records. Included were 14,228 pages of survey field notes.

The course of public land business during the past decade is shown by acres in the following table.

Fiscal year	New entries and applications								Pending entries on June 30	Vacant public land on June 30 (United States proper)
	Home- steads (original)	Deserts (origi- nal)	Timber and stone appli- cations	Min- eral appli- cation	State selec- tions	Rail- road selec- tions	All others ¹	Total		
1925.....	3, 188, 686	61, 889	26, 889	49, 827	184, 908	189, 092	73, 500	3, 774, 791	33, 018, 910	-----
1926.....	3, 001, 403	47, 171	16, 614	67, 332	102, 110	86, 489	86, 599	3, 407, 718	28, 129, 876	196, 056, 747
1927.....	3, 359, 182	35, 534	20, 361	35, 791	176, 049	14, 092	98, 437	3, 739, 446	28, 028, 292	193, 737, 588
1928.....	3, 464, 775	40, 447	15, 187	91, 329	95, 254	106, 454	73, 617	3, 887, 063	23, 282, 994	193, 847, 240
1929.....	4, 311, 591	28, 555	13, 054	27, 377	238, 023	15, 242	91, 819	4, 725, 661	21, 347, 505	189, 854, 407
1930.....	4, 920, 842	33, 355	11, 878	30, 133	281, 443	78, 363	155, 886	5, 511, 900	22, 533, 574	178, 979, 446
1931.....	4, 924, 046	32, 826	5, 945	19, 776	84, 684	77, 539	174, 210	5, 319, 026	24, 241, 042	177, 101, 551
1932.....	4, 049, 854	15, 598	3, 213	13, 484	412, 084	60, 844	53, 513	4, 608, 590	24, 164, 842	173, 318, 246
1933.....	2, 714, 029	10, 111	2, 050	4, 900	369, 979	11, 590	31, 695	3, 144, 348	23, 208, 074	172, 084, 580
1934.....	2, 862, 143	6, 456	1, 420	4, 884	662, 689	43, 146	55, 491	3, 636, 229	24, 040, 779	165, 695, 479

¹ Includes final entries which never appear as original entries.

The following is a résumé of the public land entered and disposed of during the fiscal year 1934. The Indian land is mainly the ceded Ute land in western Colorado, subject to entry upon payment of \$1.25 per acre for the Indians.

ORIGINAL ENTRIES

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stockraising.....	4, 990	2, 502, 926	146	64, 962
Enlarged.....	310	75, 208	9	2, 150
Reclamation.....	44	5, 090	41	4, 600
Forest.....	38	2, 931	-----	-----
Sec. 2289, et al.....	2, 125	201, 058	38	3, 217
Total homesteads.....	7, 507	2, 787, 213	234	74, 929
Deserts.....	65	6, 433	1	23
State selections.....	1, 005	662, 689	-----	-----
Railroad selections.....	17	43, 146	-----	-----
Applications and filings.....	145	-----	9	-----
Miscellaneous.....	56	10, 444	23	6
Total.....	8, 795	3, 509, 925	267	74, 958
Indian land as above.....	267	74, 958	-----	-----
Grand total.....	9, 062	3, 584, 883	-----	-----

FINAL ENTRIES

Homesteads:				
Stockraising.....	2, 104	916, 945	48	20, 457
Enlarged.....	373	93, 413	34	7, 414
Reclamation.....	187	17, 284	16	1, 405
Forest.....	51	5, 280	2	258
Commuted.....	19	1, 721	57	3, 953
Sec. 2289, et al.....	893	90, 751	64	5, 990
Total homesteads.....	3, 627	1, 125, 394	221	39, 477
Deserts.....	57	6, 270	3	429
Public auction.....	91	7, 202	6	661
Timber and stone.....	24	1, 573	-----	-----
Mineral.....	81	7, 004	-----	1
Miscellaneous.....	1, 419	35, 620	91	1, 401
Total.....	5, 299	1, 183, 063	321	41, 969
Indian land as above.....	321	41, 969	-----	-----
Grand total.....	5, 620	1, 225, 032	-----	-----

PATENTS AND CERTIFICATIONS

	Number	Acres
Homesteads:		
Stockraising.....	1,507	726,859
Enlarged.....	323	82,589
Reclamation.....	283	23,224
Forest.....	71	7,264
Commuted.....	17	1,668
Sec. 2289, et al.....	730	74,970
Total homesteads.....	2,931	916,574
Deserts.....	62	7,567
Public auction.....	122	9,970
Timber and stone.....	20	1,430
Mineral.....	110	22,021
Railroad.....	22	64,567
Miscellaneous.....	2,249	266,403
Total patents.....	5,516	1,288,532
Certified to States.....		106,920
Grand total.....		1,395,452

LEASES AND PERMITS OUTSTANDING ON JUNE 30, 1934

	Licenses		Permits		Leases	
	Number	Acres	Number	Acres	Number	Acres
Oil and gas.....			5,238	8,435,533	848	294,720
Coal.....	105	4,244	275	205,549	350	69,332
Potash.....			200	420,682	12	29,465
Sodium.....			38	51,603	1	640
Phosphate.....					8	4,233
Sulphur.....			22	12,857		
Nonmineral excluding grazing.....					78	172,330
Total.....	105	4,244	5,773	9,126,224	1,297	570,720

RECEIPTS AND EXPENDITURES

The cash receipts were \$4,035,441.08 as shown by accompanying table, an increase of \$176,010.11 over the previous year. The expenditures paid through this office and before final settlement in the General Accounting Office were \$2,013,235.39.

Source of receipt	Distribution in the treasury			
	General fund	Reclamation fund	State fund	Total
Sale of public lands.....	\$34,179.15	\$60,911.57	\$4,047.62	\$99,138.34
Fees and commissions.....	70,986.10	189,235.00		260,221.10
Bonuses, rentals, and royalties from mineral leases.....	342,323.98	1,682,695.34	1,201,925.24	¹ 3,226,944.56
Proceeds of land and timber in Oregon and California railroad grant.....			269,026.28	² 269,026.28
Proceeds of land and timber in Coos Bay wagon road grant.....	4,038.67		³ 1,060.97	5,099.64
Fees from copies of records.....	18,819.29			18,819.29
Royalties on coal leases in Alaska.....	5,277.67			5,277.67
Royalties and rentals from potash deposits.....		57,159.64		⁴ 57,159.64
Power permits.....	15,275.00			15,275.00
Sale of reclamation town sites.....		2,731.75		2,731.75
Sale of standing timber in Alaska.....	5,486.82			5,486.82
Miscellaneous (surveying fees, rent of lands, proceeds of Government property, etc.).....	8,846.94			8,846.94
Total.....	505,233.62	1,992,733.30	1,476,060.11	3,974,027.03
Sales and leases of Indian lands.....				⁵ 61,414.05
Aggregate.....				4,035,441.08

¹ First and fourth columns contain \$20,319.93 royalties received in Wyoming under the act of June 26, 1926.

² This amount is payable to certain counties in Oregon in lieu of taxes.

³ Amount payable to Coos County, Ore., 25 percent of proceeds of land and timber.

⁴ Potash royalties on permits and leases issued under the act of Feb. 7, 1927 (44 Stat. 1057), are deposited as "Receipts under the mineral leasing act" and distributed accordingly.

⁵ Of the amount received as royalties from oil lands in the bed of Red River, Okla., 37½ percent, \$12,007.23, is paid to Oklahoma, and the balance, \$20,012.03, is credited to the Kiowa, Comanche, and Apache Indians.

SURVEYING AND MAPPING

The Cadastral Engineering Service of this office performs practically all surveys for title purposes within the original public land States for the various Federal bureaus and departments, and is thus one of the great governmental surveying services. Its organization plan with 144 members remained unchanged, but was automatically expanded to meet two new situations. First, the surveying operations under the Federal Emergency Administration of Public Works initiated September 30, 1933, added 54 transitmen, 28 clerks and draftsmen, and a monthly average of 341 temporary field assistants. It gave a total of 770,945 man-hours of work. Second, from December 12, 1933, to April 30, 1934, there was employed a weekly average of 460 transitmen, field assistants and clerks under Civil Works Administration directed by this service, and providing 254,680 man-hours of work. The relief funds were used on important projects requiring a maximum number of workers and that had been long contemplated or had been requested by other bureaus.

Surveys and resurveys were made under 244 groups in 23 States and Alaska. Such work as can be measured on a quantity basis equaled 35,970 linear miles or 6,290,089 acres surveyed, composed as follows. Approximately 2,300,000 acres of public land were surveyed (sectionized) and 1,300,000 acres resurveyed. Surveys for the Forest Service were 1,200,000 acres of original surveys and 916,000 acres of resurveys. Resurveys amounting to 527,800 acres were made for the Reclamation Service. Lesser areas were surveyed for the National Park Service, United States Geological Survey, War Department, Office of Indian Affairs, and Federal Power Commission. Some of the work were the special determinations and the fragmentary and miscellaneous surveys, involving little acreage, which increase with time and require an undue amount of investigation and work for the results produced. Such work was postponed as much as possible because of the relief situation, and this partly explains why the comparable figure for 1933 was 19,364 linear miles surveyed. Surveying for Indian reservations was restricted to emergency work. Nearly all of Alaska and 133,562,439 acres within the United States proper are yet unsurveyed.

The expenditures were \$193,062.44 from the regular appropriation for surveying the public land, \$735,527.43 from the Public Works fund, and \$25,201.73 from miscellaneous sources, a total of \$953,791.60. In addition, approximately \$219,600 was expended from the Civil Works funds. This compared with a total expenditure in 1933 of \$521,829.81 from the regular surveying funds.

The official map of the United States has been revised for a new edition. The new state maps of Idaho and Oregon and more recently Arizona have arrived in stock, while the new maps of Alaska and Colo-

rado have been sent to the printer. Maps mounted were 1,927 and distributed were 5,293. Public land circulars and regulations distributed were 165,366.

HOMESTEADS

Allowed original homestead entries in acres reached their lowest level in December 1932, since 1869. New homestead entries in the fiscal year 1934 were about 92½ percent of those in 1925 and 1926, and the new filings mounted rapidly in the last half. The total pending and unperfected homestead entries on June 30, 1934, were 54,020 entries embracing 19,883,591 acres. Seventy percent of this acreage is, in descending order, in the Rocky Mountain States of New Mexico, Wyoming, Montana, and Colorado.

The homestead division of this office during the year acted upon the following cases, exclusive of Indian land.

Incoming original entries-----	8, 906	Appeals-----	14, 375
Approved for patent-----	4, 098	Contests-----	1, 755
Application to make second entry-----	1, 110	Timber and stone applications_	136
Application to amend entry---	670	Public sale applications-----	420
Leaves and extensions-----	3, 013	Total-----	34, 483

The above compares with 28,406 cases in 1933 and 26,555 in 1932. There were received and disposed of 46,259 related and unrelated letters against 59,035 in 1933, and 65,667 in 1932. The number of these letters has doubled since 1930.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—During the year 1,226 cases received office action. There were issued 36 leases embracing 38,555 acres under section 14 of the leasing act as a result of discoveries of oil and gas on prospecting permits. One lease was granted under section 17 on a bonus bid of \$11,000 at a sale of leases in the Rodessa Gas Field in Louisiana. The defined geologic structures of the following six producing oil and gas fields were promulgated: Dry Creek, North Bowes and South Bowes in Montana; North Eunice (additional) in New Mexico; La Barge and Lake Creek in Wyoming. A unit plan of development and operation of Middle Dome in the Kettleman Hills field of California was approved on September 30, 1933, and 10 leases covering 4,537 acres were issued. The instructions of December 4, 1933, require leases thereafter to include an agreement to abide by the Code of Fair Competition for the Petroleum Industry. The act of June 16, 1934, provides for the use of water from water wells drilled by permittees and lessees through reserving as a public watering place the land on which the well is situated. The number and acres of outstanding leases and permits for all minerals are shown in the earlier table on disposals.

Oil and gas prospecting permits.—There were filed 1,583 new applications for oil and gas permits. Permits granted were 907, of which 12 were in Alaska. Permits canceled were 231. Applications entirely rejected were 676 and in part were 807. Nine canceled permits were reinstated, and 153 assignments and 1,443 applications for extension of time were considered. The total cases examined for some office action were 14,087.

Coal.—A total of 2,784 cases were acted upon. There were issued 52 coal prospecting permits for 30,207 acres, 26 licenses for 1,010 acres to mine coal, and 31 coal leases for 1,916 acres.

Potash, sodium, sulphur, and phosphate.—Cases acted upon were 803. There were issued 14 potash permits involving 30,907 acres, 19 sodium permits for 25,755 acres, 1 sodium lease for 640 acres and 38 permits for 51,603 acres, and 22 sulphur permits for 12,857 acres.

Receipts under mineral leasing acts.—The receipts for the year under the act of February 25, 1920, were \$2,892,498.47 from oil and gas, \$234,497.34 from coal, \$75,064.95 from potash, \$4,460.61 from phosphate, and \$103.26 from sodium, a total of \$3,206,624.63. These receipts were obtained from the following State areas:

Alabama.....	\$10, 614. 60	North Dakota.....	\$16, 817. 61
California.....	1, 672, 953. 58	South Dakota.....	401. 40
Colorado.....	50, 474. 91	Utah.....	68, 266. 34
Idaho.....	3, 352. 19	Washington.....	9, 645. 19
Louisiana.....	13, 927. 31	Wyoming.....	1, 134, 711. 74
Montana.....	59, 842. 19		
Nevada.....	160. 00	Total.....	3, 206, 624. 63
New Mexico.....	165, 457. 57		

The total receipts from date of act to June 30, 1934, are \$90,181,-750.52. Each State receives 37½ percent of the receipts arising within its borders, the reclamation fund receives 52½ percent, and the remaining 10 percent is retained in the United States Treasury under miscellaneous receipts. During the year there was received \$20,319.93 in royalties in Wyoming under act of June 26, 1926, and \$5,277.67 from coal royalties in Alaska, all of which was retained in the Treasury. The royalties from oil lands in the bed of Red River in Oklahoma were divided 37½ percent or \$12,007.23 to the State and balance, \$20,012.03, to Kiowa, Comanche, and Apache Indians. The potash royalties and rentals in California under act of October 2, 1917, were \$11,945.71 and those in New Mexico under act of February 7, 1927, were \$45,213.93, all of which went to the reclamation fund.

Contests against oil-shale locations.—Action has been suspended since April 1, 1933, awaiting court decision on jurisdiction of the Department to challenge the validity of oil-shale locations for failure to perform annual labor thereon. There are pending 503 Government contests against such locations.

Oil-shale claims under patent proceedings.—Four oil-shale entries covering 3,648 acres were approved for patent, 2 entries for 1,919 acres were canceled and 8 entries for 6,343 acres are still pending.

Mineral entries other than oil-shale.—Mineral applications disposed of were 172. Final mineral entries acted upon were 333, of which 115 were approved for patent. There were disposed of 653 highly miscellaneous mineral cases not involving mineral entry.

San Gabriel and Boulder Dam locations.—The cities of Los Angeles and Pasadena were granted reservoir rights in San Gabriel Canyon in the Angeles National Forest of southern California. Field investigation in recent years reported 429 recorded mining locations as invalid. After hearings asked for on several claims, all were finally canceled except two locations still undisposed of. Field investigation was made in the past of some 3,000 recorded mining locations in the area reserved for the Boulder Dam and Reservoir site. Four locations were reported valid and together with some patented claims are under appraisal. Thirty locations were declared to be null and void after hearing, 8 are still on appeal from adverse decision, and balance of the 3,000 locations have been canceled save 1 undisposed of. Essentially, the two investigations cleared the record of long abandoned mining locations that might be made the basis of damage suits.

Coal-bed fires.—The work in controlling fires on the outcrop of coal beds on the public land near Gillette, Wyo., which was carried on by a Civilian Conservation Camp during the summer of 1933, has been continued this summer.

EXCHANGES

Various acts provide for relinquishing private land useful for governmental purposes in exchange for public land or timber. The Santa Fe Pacific Railroad Co. (Atlantic and Pacific grant) exchanged 124,941 acres in northwestern New Mexico to benefit the Navajo Indians, and 3,833 acres to enlarge the Petrified Forest National Monument in Arizona. Title to 67,919 acres of private land within national forests was so obtained, including 41,444 acres of the Mora Grant in the Lincoln National Forest in New Mexico. There were likewise added 7,780 acres to various Indian reservations. Forest lieu selection under act of June 4, 1897, has reduced to a few hundred acres annually.

GRAZING

One grazing lease of 1,408 acres was issued in Alaska, making 18 leases outstanding for 10,550,857 acres. Six of these leases are to associations of natives for grazing reindeer.

The act of March 4, 1931, withdrew 334,765 acres for the protection of the water supply of Los Angeles and other cities. This is the area now being administered as the Owens River-Mono Basin Grazing

Reserve, and about 70 free-use permits are outstanding. Subsequent Executive orders added 266,600 acres for water supply protection, and during the fiscal year another 265,000 acres were so added.

The only other grazing district is the Mizpah-Pumpkin Creek Grazing Reserve in Custer County, southeastern Montana. An association of local cattlemen was formed and on May 9, 1932, a lease was issued for approximately 25,124 acres at an annual rental of \$785.

Two withdrawals for proposed grazing districts have existed since 1931 in Montana, the South Sunday Creek area in Rosebud and Custer Counties estimated at 192,320 acres, and the Crooked and Gilbert Creeks area in Garfield County estimated at 175,000 acres. The departmental order of September 26, 1933, withdrew approximately 1,837,400 acres in Uintah County, Utah, for a proposed grazing district for the Uncompahgre Ute Indians and the white settlers within the area, of which about 1,280,312 acres is public land. Public Grazing Withdrawal No. 4 of February 6, 1934, withdrew 1,221,120 acres 60 miles southwest of Salt Lake City, of which about 1,000,000 acres is public land.

MISCELLANEOUS LEASES

Six leases were issued for public aviation fields. There are now outstanding 19 such leases totaling 10,033 acres and 5 permits aggregating 5,197 acres for beacon lights. Recreational area leases to States, counties, or municipalities number 14 for 14,065 acres. One hot springs lease for 39 acres exists. Five fur farming leases amounting to 6,600 acres were issued in Alaska, bringing total to 44 leases for 148,193 acres.

RIGHTS-OF-WAY

Thirteen railroad rights-of-way were approved and requirements made in 38 more, all as amendments or extensions of existing systems. Rights-of-way approved for irrigation, pole lines, public roads, and pipe lines numbered 342 and requirements were made in 695 cases more. There were promulgated 74 approved rights-of-way in Indian reservations.

FEDERAL RECLAMATION

There are 32 Federal reclamation projects in 14 western States and 5 Indian reclamation projects. The gross area withdrawn during the year under the Reclamation Act was 850,880 acres and 850,815 acres heretofore withdrawn were restored. Additionally there were withdrawn under the act of June 25, 1910, at the request of the War Department 204,720 acres for the Fort Peck project in Montana

and 79,080 acres for the Bonneville Dam in Oregon and Washington, both Public Works Administration projects. The Fort Peck project is in aid of the Missouri River Basin flood control, irrigation, navigation, and power development. The new openings to entry under Reclamation Act were 1 farm unit of 115 acres in the Shoshone project (Wyoming) and 26 farm units totaling 1,700 acres in the Yakima project (Washington). The average life of a reclamation homestead from entry to patent is upwards of 10 years. The reclamation homestead patents in the decade of 1915-24 were 5,658 patents for 422,624 acres, while in the 1925-34 decade there were 1,966 patents for 162,398 acres. During the 1925-34 period there were 865 original entries for 89,969 acres. The number of entries and patents during 1934 is shown elsewhere. Old and new entries under the Reclamation Act totaling 1,795 were examined in the office for some action.

CAREY ACT

Section 4 of the act of August 18, 1894, and its 23 supplemental acts are collectively known as the Carey Act. The act grants to certain arid-land States one to three million acres each of desert land upon condition of large scale reclamation. Land for this purpose is either segregated or is temporarily withdrawn for investigation. Patents are issued only on proof that water has been made available for irrigation. To June 30, 1934, there were segregated 3,897,860 acres, out of which 1,102,586 acres have been patented, 2,575,678 acres have been returned to the public land, and 219,596 acres remain segregated of which 42,322 acres are under proof of reclamation. The area now under temporary withdrawal is 668,675 acres, as follows:

State	Withdrawals	Segregations	State	Withdrawals	Segregations
Arizona.....		13, 745	Oregon.....		56, 813
Colorado.....	35, 824		Wyoming.....		105, 007
Idaho.....	632, 851	43, 078			
Montana.....		953	Total.....	668, 675	219, 596

Construction work on Carey Act projects has been largely in abeyance for 4 years, mainly for economic reasons. During the year 738,131 acres of Carey Act land received some necessary office action. There were filed patent applications for 3,724 acres and segregation application was made for 2,242 acres.

SWAMP AND OVERFLOWED LAND

Four applications under this act were made during the year by the State of Louisiana and four by California. The State of Oregon received patent for 21,431 acres in the Warner Valley and 6,800 acres went to other States. Among pending applications is one by the State

of Wisconsin for approximately 43,737 acres within the Lac du Flambeau, Bad River, and Menominee Indian Reservations upon some of which allotments and patents have issued to Indians; various questions of fact, record, and law are involved.

STATE SELECTIONS

These are composed of quantity or acreage grants for specific purposes and of indemnity lands selected in lieu of school sections lost to the State through mineral character or prior occupation or reservation. Ninety percent of the selections during the past 5 years have been for indemnity lands. The selections filed during the fiscal year are as follows in acres:

State	Quantity	Indemnity	State	Quantity	Indemnity
Arizona.....	80	589,747	Oregon.....		119
California.....		557	Utah.....	49,894	719
Colorado.....		114	Washington.....		240
Idaho.....		640	Wyoming.....		80
Montana.....		1,878			
New Mexico.....	7,152	11,469	Total.....	57,126	605,563

The pending old and new selections examined in the office during the year amounted to 920,146 acres, of which 9,485 acres were canceled, 106,921 acres were certified to the States and further requirements were made on the remainder.

RAILROAD LANDS

Nine out of the 72 unforfeited railroad grants remain to be closed: Atlantic and Pacific (western division), Southern Pacific (branch line), Southern Pacific (main line), Northern Pacific, Central Pacific, California and Oregon, Cairo and Fulton, Memphis and Little Rock, and St. Paul and Pacific.

Adjustment of the Northern Pacific grant has been suspended pending court decision on the company's rights. There are outstanding approximately 3,000,000 acres of primary and indemnity lands unapplied for. Most of this is within the Atlantic and Pacific grant in Arizona and New Mexico, and the Southern Pacific (branch line) grant in California. Lack of surveys and inclusion within Indian reservations are largely responsible for this situation. During the fiscal year the following new selections were filed: 16,547 acres in Arizona, 26,339 in New Mexico, 179 acres in California, and 40 acres each in Montana and Washington. Office action during the year approved 63,671 acres to the companies, rejected 684 acres, and made further requirements on 194,099 acres.

OREGON AND CALIFORNIA RAILROAD GRANT LAND

The act of June 9, 1916, revested in the United States approximately 2,800,000 acres of land formerly granted to the Oregon &

California Railroad Co., with provisions for classification and disposition thereof and for disposal of the moneys received. During the year 20,379 acres were homesteaded and 10,752 acres of former entries were canceled. There were 70 timber sales involving 5,238 acres and aggregating \$252,967. These lands are situated in western Oregon and inventoried as follows on June 30, 1934: (1) 1,128,326 acres of unsold timberland containing 30,305,628,000 board-feet of timber; (2) 105,098 acres on which timber has been sold and included in which are 18,444 acres of cut-over land subject to entry and 10,951 acres of pending entries (and 2,280 acres patented); (3) 56,231 acres of power-site land containing 824,321,000 board-feet of timber; (4) 8,360 acres of recreational land; (5) 752,582 acres of agricultural classification subject to entry; (6) 84,197 acres of agricultural classification in pending entries, and (7) 528,004 acres within the indemnity limits of the grant and within the boundaries of national forests remain unclassified. The area associated with (1) and (2) that is listed as unrestored timberland is 1,201,749 acres. This land will be restored to entry as agricultural land of cut-over character as the timber is sold, cut, and removed.

COOS BAY WAGON ROAD GRANT LAND

Under the act of February 26, 1919, there were reconveyed to the United States approximately 90,000 acres of land formerly granted to the Coos Bay Wagon Road Co. in western Oregon. The land was to be classified and disposed of in the manner prescribed by the act of June 9, 1916, and the resulting moneys as prescribed by the act of February 26, 1919. During the year 2,100 acres were homesteaded and 520 acres of former entries were canceled. There were two timber sales involving 120 acres and aggregating \$4,700. These lands inventoried as follows on June 30, 1934: (1) 40,735 acres unsold timberland containing 1,551,083,000 board-feet of timber; (2) 15,229 acres on which timber has been sold and included in which are 4,195 acres of cut-over land subject to entry and 2,462 acres of cut-over land in pending entries (and 200 acres patented); (3) 4,464 acres of power-site land containing 181,460,000 board-feet of timber; (4) 14,900 acres of agricultural classification subject to entry; and (5) 7,197 acres of agricultural classification in pending entries. The unrestored timberland withdrawn from agricultural entry is 49,107 acres.

MISCELLANEOUS

Some 4,712 highly miscellaneous cases were acted upon and 1,459 patents were approved, which involved Indians and Indian land (land subject to certain public land entries with proceeds to Indians), and Indian reservations, pueblos, allotments and exchanges. Soldiers' additional homestead rights were granted in certain cases to Civil War veterans and their widows and minor children; 20 entries under

these rights covering 419.13 acres were patented and it is believed that several thousand acres of these rights are still outstanding. Action was taken on 1,271 trespass cases involving timber, coal, turpentine, and gravel. Sales of land in abandoned military reservations amounted to \$2,988.16 for 1,675.92 acres. Patents were approved for 189 town lots in 25 town sites. Desert-land cases receiving office action were 1,451, of which 76 were approved for patent and 110 were canceled.

Congress has directed that the Commissioner of the General Land Office and the Secretary of the Interior shall constitute a Board of Equitable Adjudication to adjudge if patents may issue in accordance with equity and justice where some obstacle has arisen through mistake, ignorance, or cause beyond control of the entryman. During the fiscal year patents were so confirmed on 643 homesteads, 38 deserts, and 1 mineral entry.

There were decided 2,152 Government and private contests and at the end of the fiscal year there were pending unadjudicated 503 oil-shale contests, 77 mineral contests, and 442 miscellaneous contests. There were enacted 49 public and private acts of Congress affecting the activities of this office, and 328 such acts during the last 5 years.

WITHDRAWALS

Nine new stock driveways were established and 41 were modified during the year. The net area of the national forests in the public-land States was increased 532,983 acres. There were temporarily withdrawn 6,486 acres for forest purposes and 80 acres were restored. The national forests in the public-land States have a gross area of 159,978,063 acres, of which 138,120,193 acres or 86.3 percent is net Government land. Those in Alaska are 21,342,300 acres net after deducting 54,633 acres of private land. Two national monument changes were made. The Pinnacles in California was increased 5,002 acres and Cedar Breaks in Utah was created by exclusion of 5,821 acres from the Dixie National Forest. Six recreational area withdrawals were made on petitions by States or cities. Forty acres for this purpose were sold to Pima County and 538 acres leased to Mohave County, Ariz. Additions to bird and game refuges amounted to 133,426 acres and 56,270 acres were withdrawn for creation of further refuges. The existing refuges in the public-domain area aggregate 1,512,371 acres and 162,691 acres are withdrawn for further refuges, both mainly within other withdrawals and reservations.

Among the withdrawals during the year were 265,000 acres for the Los Angeles water supply, 1,162,286 acres for investigation with a view to creating a national monument perpetuating desert plant life and 80,000 acres for a bombing and gunnery range for the War Department, all in California. In New Mexico, 441,000 acres were withdrawn to enable the State to select land in lieu of school sections and

other State land within national forests. In Oklahoma, 4,858 acres were withdrawn pending legislation for relief of bona fide claimants, and 6,360 acres in Nevada for flood and erosion control. The withdrawal situation is as follows:

	Withdrawn in 1934	Restored in 1934	Pending withdrawn June 30, 1934
Stock driveways.....	124, 009	15, 529	9, 771, 386
Recreational area withdrawals.....	2, 409		284, 285
Air navigation sites.....	1, 675	2, 885	32, 880
Carey Act withdrawals.....			668, 675
Carey Act segregations.....			219, 596
Reclamation withdrawals.....	850, 880	850, 815	20, 208, 621
San Carlos irrigation project (Indian).....			136, 860
Fort Hall irrigation project (Indian).....		1, 280	114, 720
Fort Peck project, Montana.....	204, 720		204, 720
Bonneville dam, Oregon-Washington.....	79, 080		79, 080
Water-power reserves (non-Indian).....	257, 954	20, 983	5, 147, 654
Reservoir and well sites.....			254, 130
Public water reserves.....	11, 027	1, 720	480, 708
Los Angeles water supply ¹	265, 000		866, 365
Mizpah-Pumpkin Creek grazing district.....			25, 124
Grazing withdrawals.....	3, 058, 520		3, 425, 840
Oregon-California and Coos Bay unrestored timberland.....		10, 615	1, 250, 856
Created into national forests in 1934.....	192, 095		
For Boulder Canyon transmission line.....		179, 040	1, 861, 170
For forest exchange with New Mexico.....	441, 000		681, 000
For game and bird refuges.....	56, 270		162, 691
For national forest purposes.....	6, 486	80	134, 653
For national parks and monuments.....	1, 162, 286	81, 945	3, 943, 497
For New Mexico-Arizona Indian consolidation.....			1, 134, 972
For military firing range.....	80, 000		(²)
For agricultural experiment stations.....			310, 179
For flood and erosion control.....	6, 360		15, 720
For State game refuge investigation.....			73, 080
For recreational investigation.....			43, 793
For irrigation-power investigation.....			30, 880
For archaeological investigation.....			11, 090
For miscellaneous purposes.....	5, 564		11, 042
	6, 805, 335	1, 164, 892	51, 585, 267

¹ Includes Owens River-Mono Basin grazing district.

² Excluded.

It is estimated that the 51,585,267 acres of withdrawals contain 30,442,832 acres net of Government land in the public-domain States.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

Mineral withdrawals must be completely separated in idea from other withdrawals. They relate to subsurface rights as the surface is usually open to agricultural entries unless a reservation of the surface is also necessary to effect the purpose of the withdrawal. The changes during the year were 1,323 acres of helium land in Utah withdrawn, while the restorations were 936,433 acres of coal land withdrawals in New Mexico and 136 acres of other withdrawals. The acreage now classified or withdrawn for classification, which includes much land patented without mineral reservation, is as follows:

	Withdrawn	Classified		Withdrawn	Classified
Coal.....	27, 277, 025	33, 051, 659	Helium.....	13, 578	
Oil and gas.....	5, 155, 015	71, 884	Metalliferous.....	8, 507	
Oil shale.....	6, 238, 422	4, 061, 997			
Phosphate.....	1, 889, 456	302, 219	Total.....	49, 993, 909	37, 487, 759
Potash.....	9, 411, 906				

The helium (Utah) and metalliferous (East Bisbee, Ariz.) withdrawals are closed to all location and entry. There are 77,730 acres of naval oil reserves, 156,024 acres of naval oil-shale reserves, and 960,346 acres of defined geologic structures of producing oil and gas fields, all gross areas before deducting the private lands.

The acreage patented during the year under agricultural laws with mineral reservation is shown in the patent table. The total acreage so patented to June 30, 1934, is 25,053,209 acres under the Stock Raising Homestead Act, 10,752,105 acres with coal reservation, and 2,022,916 acres with all or some specific minerals reserved, a total of 37,828,203 acres. Sixty-four percent of the acreage patented in the past 10 years has been with mineral reservation.

DISPOSITION OF PUBLIC DOMAIN

The disposition of the public domain in the United States proper under more than 5,000 acts of Congress has been extremely complex, but the following table pictures the situation in its simplest form:

Title passed from the United States:		<i>Acres</i>
Homesteads (approximate).....		275, 125, 000
Cash sales and miscellaneous disposals (approximate).....		418, 100, 000
Railroad grants to corporations.....		94, 219, 087
Railroad grants to States.....		38, 206, 487
Wagon road grants to States.....		3, 359, 188
Canal and river improvement grants to States.....		6, 842, 921
Swamp, educational, and other grants to States.....		181, 679, 623
Total area disposed of.....		1, 017, 532, 306
Pending and unperfected public land entries.....		24, 040, 779
Title remaining in the United States:		
National forests.....		138, 120, 193
National parks and monuments.....		8, 692, 196
Indian reservations (estimated net).....		56, 676, 535
Military, naval, and similar reservations, etc. (approximately).....		1, 000, 000
Withdrawals (estimated net).....		30, 442, 832
Unappropriated and unreserved land.....		165, 695, 479
Grand total.....		1, 442, 220, 320

Homestead entries, fiscal year of 1934, includes Indian lands

State	Original		Final		State	Original		Final	
	Num-ber	Acres	Num-ber	Acres		Num-ber	Acres	Num-ber	Acres
Alaska.....	50	5, 755	54	2, 953	Oregon.....	575	118, 938	195	43, 789
Arizona.....	423	145, 471	422	128, 484	South Dakota.....	154	54, 988	92	18, 805
California.....	648	132, 908	452	100, 884	Utah.....	188	83, 974	108	45, 058
Colorado.....	693	254, 349	184	59, 237	Washington.....	97	13, 968	24	4, 469
Idaho.....	366	148, 069	135	38, 523	Wyoming.....	1, 529	794, 275	756	338, 107
Montana.....	690	275, 501	622	153, 116	G. L. O. ¹	485	34, 898	246	21, 679
Nevada.....	49	13, 329	34	8, 421					
New Mexico.....	1, 688	767, 485	491	196, 432	Total.....	7, 741	2, 862, 142	3, 848	1, 164, 871
North Dakota.....	106	18, 234	33	4, 914					

¹ Entries made in General Land Office for land in States without district land offices. The original entries were 235 in Arkansas, 18,760 acres; 57 in Oklahoma, 4,819 acres; 53 in Alabama, 2,975 acres; 30 in Louisiana, 1,795 acres; 25 in Mississippi, 1,516 acres; 24 in Minnesota, 1,296 acres; 13 in Nebraska, 1,044 acres; 15 in Florida, 975 acres; 11 in Kansas, 771 acres; 12 in Michigan, 654 acres; 6 in Wisconsin, 203 acres; 2 in Missouri, 80 acres; and 2 in Indiana, 10 acres.

The above 7,741 original entries include in addition to the three main homestead acts, 38 forest, 2,931 acres; 85 reclamation, 9,690 acres, and 5 Kinkaid homesteads, 384 acres. The final entries likewise include 53 forest, 5,539 acres; 203 reclamation, 18,690 acres; 12 Kinkaid, 1,210 acres; and 38 soldiers' additional homesteads, 671 acres. The finals include 76 commuted entries, 5,675 acres.

Desert land entries, fiscal year of 1934, includes Indian land

State	Original		Final		State	Original		Final	
	Num-ber	Acres	Num-ber	Acres		Num-ber	Acres	Num-ber	Acres
Arizona.....	8	720	9	1,001	Oregon.....	13	1,100	5	382
California.....	12	1,542	11	1,843	Utah.....	8	748	7	760
Colorado.....	3	103	6	774	Washington.....	1	40	1	11
Idaho.....	4	165	4	234	Wyoming.....	12	1,786	7	644
Montana.....	1	36	7	766	Total.....	66	6,456	60	6,699
Nevada.....	3	138	3	284					
New Mexico.....	1	78							

The above final entries include under relief acts 2 entries, 480 acres under act of March 4, 1915; 11 entries, 1,748 acres under act of March 4, 1929; and 1 entry, 160 acres under act of February 14, 1934.

Other entries, fiscal year of 1934, Indian land included

State	Public auc-tion, final		Timber and stone, final		Mineral, final		Miscellaneous			
							Original		Final	
	Num-ber	Acres	Num-ber	Acres	Num-ber	Acres	Num-ber	Acres	Num-ber	Acres
Alaska.....					10	2,357	1	160	12	93
Arizona.....	3	415			5	479	¹ 31	6,868	17	145
California.....	8	440	5	233	23	1,082	10	334	10	80
Colorado.....	12	772			8	310	² 1	1,285	6	800
Idaho.....	5	292	2	68	8	947	2		25	
Montana.....	7	476			4	103	7	86	40	38
Nevada.....	2	200			2	306	1	160	2	
New Mexico.....	5	599			2	44	3	480	³ 1,236	20,103
North Dakota.....									1	
Oregon.....	13	848	1	40					77	
South Dakota.....	2	160							11	513
Utah.....	1	20			17	917			⁴ 25	12,954
Washington.....	4	204	3	85	1	20	17		11	59
Wyoming.....	31	3,390	8	836	1	440	⁵ 6	1,077	3	303
General Land Office.....	4	47	5	311					⁶ 34	1,933
Total.....	97	7,863	24	1,573	81	7,005	79	10,450	1,510	37,021

¹ Consists of 1 entry of cactus land for State, 2,877 acres, and 30 lieu selections, 3,991 acres.

² Carey Act segregation.

³ Includes 1,211 private claims, 19,740 acres.

⁴ Includes 21 potassium entries, act of Oct. 2, 1917, 12,845 acres.

⁵ Includes 957 acre, Corey Act segregation.

⁶ Consists of 20 color-of-title entries, 560 acres, and 14 cash sales, 1,373 acres.

Town lot entries have no acreage shown.

Patents issued during fiscal year ended June 30, 1934

Class	Number	Acres	Class	Number	Acres
Cemetery site.....	2	30.00	Railroad lieu.....	4	578.00
Commuted homestead.....	17	1,667.55	Reclamation homestead.....	283	23,223.85
Desert land.....	61	7,413.77	Reclamation desert land.....	1	153.46
Forest exchange.....	16	3,474.45	Reissue.....	527	(³)
Forest homestead.....	71	7,264.13	Small holding claim.....	4	206.95
Forest lieu.....	3	200.00	Soldiers' additional home- stead.....	20	419.13
Homestead, sec. 2289, etc.....	¹ 710	74,550.80	Special acts.....	837	172,251.82
Homestead, enlarged.....	323	82,589.26	Supplemental, act Apr. 14, 1914.....	115	(⁴)
Homestead, stock raising.....	1,507	726,859.05	Swamp.....	20	28,231.11
Indian fee.....	253	(²)	Timber and stone.....	20	1,429.82
Indian homestead, reserva- tion trust.....	113	18,134.07	Timber sales.....	64	(⁵)
Indian trust.....	90	6,375.15	To complete records.....	38	(⁶)
Military land warrant.....	2	280.00	Town lots.....	109	68.10
Mineral.....	110	22,021.37	Valentine scrip.....	1	40.00
Miscellaneous cash.....	21	3,039.34	Total.....	5,516	1,288,532.26
Public sale.....	122	9,970.01			
Private land claim.....	34	33,572.47			
Railroad.....	18	63,988.60			

¹ Includes 7 Kinkaid Act patents, 680 acres.² 36,047.41 acres.³ 75,565.91 acres.⁴ 18,178.72 acres.⁵ 4,836.71 acres.⁶ No area to be reported.

Area patented with coal reserved, 9,451.23 acres; with oil, gas, phosphate, etc., reserved, 21,363.58 acres; with all minerals reserved, all of stock-raising homesteads and 18,748.41 acres under other acts.

The "special acts" above include 133,550 acres of exchanges to consolidate Indian reservations and allotments, 17,556 acres for quieting titles in Indian pueblos and 3,833 acres of exchanges for consolidating a national monument, all in New Mexico; 2,071 acres for consolidating Indian reservations in Arizona; 6,726 acres for benefit of bona fide claimants on an adjusted railroad grant in Colorado; and 5,570 acres for consolidating national forests.

Applications filed under mineral leasing act of Feb. 25, 1920

State	Filed in 1934	Total to June 30, 1934	State	Filed in 1934	Total to June 30, 1934	State	Filed in 1934	Total to June 30, 1934
Alabama.....		16	Louisiana.....		262	Oregon.....	46	400
Alaska.....	42	1,729	Michigan.....		3	South Dakota.....	28	371
Arizona.....	18	1,898	Mississippi.....		15	Utah.....	335	13,022
Arkansas.....		24	Montana.....	199	13,025	Washington.....	12	271
California.....	358	21,645	Nebraska.....		36	Wyoming.....	241	17,380
Colorado.....	204	8,966	Nevada.....	44	1,745	General Land Office.....	43	109
Florida.....		1	New Mexico.....	433	11,109			
Idaho.....	12	1,053	North Dakota.....	20	474			
Kansas.....		5	Oklahoma.....		557	Total.....	2,035	94,116

The above includes 57,389 applications accepted for oil and gas prospecting permits.

Vacant public land and pending entries—acres of June 30, 1934, Alaska not included

State	Vacant land	Pending entries	State	Vacant land	Pending entries
Arizona.....	13,078,560	2,700,000	Oregon.....	12,919,345	1,168,543
California.....	15,795,069	1,416,715	South Dakota.....	463,420	574,320
Colorado.....	7,552,197	1,893,325	Utah.....	22,532,110	1,112,567
Idaho.....	10,069,092	1,457,617	Washington.....	692,751	182,434
Montana.....	5,878,931	2,186,524	Wyoming.....	13,813,200	4,829,821
Nevada.....	50,975,749	941,130	General Land Office.....	(¹)	² 147,972
New Mexico.....	11,783,265	5,338,753			
North Dakota.....	141,790	91,058	Total.....	165,695,479	24,040,779

¹ Undetermined.² Entries made at Washington in areas without district offices.

At last determination on June 30, 1932, there was unappropriated and unreserved 175,924 acres in Arkansas, 32,303 in Florida, 269,451 in Minnesota, and 20,225 in Nebraska. Very small areas exist in some of the other States.

National forests and parks and monuments—net areas in public-land States on June 30, 1934

State	Forests	Parks and monuments	State	Forests	Parks and monuments
Alabama.....	135, 248	-----	Nevada.....	4, 985, 104	593
Arizona.....	11, 388, 053	1, 099, 793	New Mexico.....	8, 544, 053	179, 127
Arkansas.....	1, 296, 305	946	North Dakota.....	-----	253
California.....	19, 175, 640	2, 888, 117	Oklahoma.....	122, 268	848
Colorado.....	13, 543, 050	366, 219	Oregon.....	13, 434, 222	158, 867
Florida.....	594, 907	19	South Dakota.....	1, 072, 095	13, 419
Idaho.....	19, 620, 454	48, 342	Utah.....	7, 523, 763	142, 102
Illinois.....	10, 710	-----	Washington.....	9, 607, 280	539, 299
Iowa.....	78, 395	-----	Wisconsin.....	328, 094	-----
Louisiana.....	649, 781	-----	Wyoming.....	8, 481, 264	2, 286, 506
Michigan.....	1, 195, 645	-----	Total.....	138, 120, 193	8, 692, 196
Minnesota.....	16, 127, 836	965, 820	Alaska.....	21, 342, 300	5, 801, 509
Montana.....	206, 026	1, 926			
Nebraska.....					

State grants—Land patented or certified in fiscal year of 1934 exclusive of 96.39 acres of State railroad grants

[All areas are appropriately included in other tables]

State	Swamp land patents	School section indemnity certifications	Quantity grant certifications	State	Swamp land patents	School section indemnity certifications	Quantity grant certifications
Arizona.....	-----	41, 116	2, 319	New Mexico.....	-----	12, 085	24, 928
California.....	-----	1, 229	80	Oregon.....	21, 431	-----	-----
Colorado.....	-----	154	-----	Oklahoma.....	-----	-----	640
Florida.....	1, 132	-----	-----	South Dakota.....	-----	229	-----
Idaho.....	-----	120	-----	Utah.....	-----	10, 537	120
Iowa.....	5	-----	-----	Washington.....	-----	482	-----
Louisiana.....	1, 899	84	-----	Wisconsin.....	285	-----	-----
Minnesota.....	485	-----	-----	Wyoming.....	-----	240	-----
Missouri.....	2, 994	-----	-----	Total.....	28, 231	78, 833	28, 087
Montana.....	-----	12, 557	-----				

Railroad grants—Land approved in fiscal year of 1934 for patent or certification

[These areas are included in the tables on total grants to States and corporations]

	State	Acres
TO CORPORATIONS		
Atlantic & Pacific (now Santa Fe Pacific).....	Arizona.....	39, 798. 86
Central Pacific (California & Oregon).....	California.....	254. 47
Central Pacific.....	do.....	14, 418. 80
Do.....	Nevada.....	7, 229. 87
Do.....	Utah.....	475. 67
Northern Pacific.....	Montana.....	9. 85
Southern Pacific (main line).....	California.....	1, 387. 00
Total.....		63, 574. 52
TO STATES (STATE GRANTS FOR RAILROADS)		
St. Paul, Minnesota & Manitoba (Great Northern).....	Montana.....	40. 00
St. Paul & Northern Pacific.....	Minnesota.....	56. 39
Total.....		96. 39

State grants—Patented, certified, and school sections to June 30, 1934

State	Swamp, educa- tional, etc.	For canal and river improve- ment	For wagon roads	For rail- roads	State total
Alabama.....	2, 258, 264	400, 016	-----	3, 147, 148	5, 805, 428
Arkansas.....	9, 372, 993	-----	-----	2, 562, 610	11, 935, 603
Florida.....	21, 980, 500	-----	-----	2, 218, 705	24, 199, 205
Illinois.....	3, 639, 281	324, 283	-----	2, 595, 133	6, 558, 697
Indiana.....	4, 306, 254	1, 746, 224	170, 580	-----	6, 223, 058
Iowa.....	3, 019, 690	1, 161, 514	-----	4, 929, 923	9, 111, 127
Kansas.....	3, 606, 910	-----	-----	4, 634, 237	8, 241, 147
Louisiana.....	11, 032, 946	-----	-----	373, 057	11, 406, 003
Michigan.....	8, 787, 573	1, 250, 236	221, 013	3, 134, 058	13, 392, 880
Minnesota.....	8, 373, 947	-----	-----	8, 046, 061	16, 420, 008
Mississippi.....	5, 020, 774	-----	-----	1, 075, 345	6, 096, 119
Missouri.....	5, 578, 934	-----	-----	1, 837, 968	7, 416, 902
Ohio.....	2, 493, 006	1, 077, 294	80, 774	-----	3, 651, 074
Oregon.....	4, 374, 976	-----	2, 583, 890	-----	6, 958, 866
Wisconsin.....	6, 220, 994	883, 354	302, 931	3, 652, 242	11, 059, 521
-----	-----	6, 842, 921	3, 359, 188	38, 206, 487	-----

State	Swamp, educa- tional, etc.	State	Swamp, educa- tional, etc.	State	Swamp, educa- tional, etc.
Arizona.....	10, 542, 113	Nebraska.....	3, 458, 711	South Dakota.....	3, 434, 203
California.....	8, 426, 764	Nevada.....	2, 723, 647	Tennessee.....	300, 000
Colorado.....	4, 433, 538	New Hampshire.....	150, 000	Texas.....	180, 000
Connecticut.....	180, 000	New Jersey.....	210, 000	Utah.....	7, 464, 276
Delaware.....	90, 000	New Mexico.....	12, 732, 694	Vermont.....	150, 000
Georgia.....	270, 000	New York.....	990, 000	Virginia.....	300, 000
Idaho.....	3, 632, 157	North Carolina.....	270, 000	Washington.....	3, 044, 471
Kentucky.....	352, 509	North Dakota.....	3, 163, 551	West Virginia.....	150, 000
Maine.....	210, 000	Oklahoma.....	3, 095, 760	Wyoming.....	4, 138, 569
Maryland.....	210, 000	Pennsylvania.....	780, 000	Grand total.....	181, 679, 623
Massachusetts.....	360, 000	Rhode Island.....	120, 000		
Montana.....	5, 869, 618	South Carolina.....	180, 000		

¹ This is made up of 64,853,922 acres of swamp and overflowed land, 7,830,000 acres of agricultural college scrip, 78,179,739 acres of school sections, and 30,815,962 acres of grants for schools, colleges, public institutions, improvements, etc.

There is reserved for Alaska sections 16, 36, and certain sections 33 and a quantity grant of 100,000 acres for colleges, an estimated total of 21,445,209 acres.

Railroad grants to corporations—Total land patented or certified to June 30, 1934

	Acres		Acres
Central Pacific.....	7, 486, 438. 83	Sioux City & Pacific (Missouri Valley Land Co.).....	42, 610. 95
Central Pacific (Western Pacific).....	462, 130. 18	Northern Pacific.....	39, 064, 567. 49
Central Pacific (California & Oregon).....	3, 236, 741. 56	Oregon Central.....	128, 618. 13
Union Pacific.....	11, 935, 603. 05	Oregon & California.....	2, 777, 631. 96
Union Pacific (central branch).....	223, 141. 91	New Orleans Pacific.....	1, 001, 943. 40
Union Pacific (Kansas division).....	6, 176, 383. 76	Southern Pacific (main line).....	4, 656, 398. 32
Union Pacific (Denver Pacific).....	821, 330. 78	Southern Pacific (branch line).....	2, 245, 405. 75
Santa Fe Pacific (Atlantic & Pacific).....	11, 586, 049. 92	Total.....	94, 219, 086. 75
Burlington & Missouri River in Nebraska.....	2, 374, 090. 77		

Unsurveyed land in public-land States, acres on June 30, 1934

Arizona.....	28, 226, 683	Nevada.....	22, 654, 148	Washington.....	6, 361, 972
California.....	16, 359, 414	New Mexico.....	11, 954, 969	Wyoming.....	3, 132, 800
Colorado.....	1, 903, 960	Oregon.....	5, 311, 608	Total.....	133, 562, 439
Idaho.....	12, 416, 539	South Dakota.....	32, 445		
Montana.....	11, 326, 574	Utah.....	13, 881, 327		

OFFICE OF INDIAN AFFAIRS

(JOHN COLLIER, Commissioner)

The fiscal year 1934 has seen a reorientation of Indian Service policies, and many reorganizations completed or set under way. It has been a year of intense labor, because numerous emergency tasks (some of them of dominating importance to the Indians) have been thrown upon an overhead personnel which previously had been considered a meager one for the regular work alone. On the whole, the staff has met its challenge, and the response of the Indians has gone beyond anything previously hoped for.

A brief outline of the report follows:

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THE WHEELER-HOWARD ACT

In the last paragraph of the Commissioner's annual report for 1933 it was stated:

If we can relieve the Indian of the unrealistic and fatal allotment system, if we can provide him with land and the means to work the land; if, through group organization and tribal incorporation, we can give him a real share in the management of his own affairs, he can develop normally in his own natural environment. The Indian problem as it exists today, including the heaviest and most unproductive administration costs of public service, has largely grown out of the allotment system which has destroyed the economic integrity of the Indian estate and deprived the Indians of normal economic and human activity.

The allotment system with its train of evil consequences was definitely abandoned as the backbone of the national Indian policy when Congress adopted and the President approved the Wheeler-Howard bill. The first section of this act in effect repeals the General Allotment Act of 1887. During numerous committee

hearings, during several redrafts and modifications affecting every other part of the measure, this first section was never questioned or revised. It reached the President's desk in its original form without the change of a word or a comma, indicating that Congress was thoroughly convinced of the allotment system's complete failure and was eager to abandon it as the governing policy.

THE ACT'S TWOFOLD AIM

The Wheeler-Howard Act, the most important piece of Indian legislation since the eighties, not only ends the long, painful, futile effort to speed up the normal rate of Indian assimilation by individualizing tribal land and other capital assets, but it also endeavors to provide the means, statutory and financial, to repair as far as possible, the incalculable damage done by the allotment policy and its corollaries. Unfortunately, the beginning of the repair work had to be in large part postponed because the authorized appropriations could not be made by Congress after the passage of the act during the closing days of the session.

The repair work authorized by Congress under the terms of the act aims at both the economic and the spiritual rehabilitation of the Indian race. Congress and the President recognized that the cumulative loss of land brought about by the allotment system, a loss reaching 90,000,000 acres—two-thirds of the land heritage of the Indian race in 1887—had robbed the Indians in large part of the necessary basis for self-support. They clearly saw that this loss and the companion effort to break up all Indian tribal relations had condemned large numbers of Indians to become chronic recipients of charity; that the system of leasing individualized holdings had created many thousands of petty landlords unfitted to support themselves when their rental income vanished; that a major proportion of the red race was, therefore, ruined economically and pauperized spiritually.

ECONOMIC REHABILITATION—LAND PURCHASES

To meet this situation, the act authorized a maximum annual appropriation of \$2,000,000 for the purchase of land for landless Indians. This maximum appropriation, even if continued over a term of years, will meet only the most pressing emergency-land needs of the Indians. It must be remembered that since 1887 the Indian race has lost the use of 90,000,000 acres, the cream of its land holding. With an annual appropriation of \$2,000,000 and an average base price of \$20 per acre, it would require 20 years to restore 2,000,000 acres for Indian use.

While Congress did not specifically direct the consolidation of Indian lands broken up and checkerboarded with white holdings in the allotment process, it authorized such consolidation and set up the machinery for it. Congress also authorized the establishment of new reservations for now completely landless and homeless Indians and directed that title to all newly purchased land should be taken in the name of the United States in trust for the Indian tribe or individual Indian, who will have the use and occupancy of the land. Thus the policy of common ownership of land enunciated in section 1 of the Wheeler-Howard Act is reaffirmed and implemented throughout the body of the statute.

Part of the effort at economic rehabilitation is the indefinite extension of all restrictions on the alienation of Indian trust lands as prescribed by section 2. However, this section merely locks the door out of which passed the valuable team of work horses, leaving the decrepit plug behind.

THE REVOLVING CREDIT-FUND

The sponsors of the General Allotment Act of 1887 believed that the division of the tribal land among the members of the tribe would create in the Indian the pride of individual ownership and induce him to make use of his own land for the support of his family. Overlooked entirely was the cold fact that capital in some form is needed to transform even a piece of the best raw land into a productive farm. Since the Indian's newly acquired private land could not legally be pledged as security for bank or private loans, it was the duty of the Federal Government to place at the disposal of its wards, credit in sufficient volume to meet their need for operating capital.

This imperative duty the Federal Government never recognized. Instead, it chose the easier road. It rapidly relaxed its restrictions on leasing. Lacking equipment for farming, the average Indian family proceeded to lease its land to white farmers or stockmen for cash. The leasing system, demoralizing to the Indians and contributing to the surplus of commercial farm products, spread like the Russian thistle. To this day the Indians who rely on the shrinking volume of lease money for their main support far outnumber those who farm their own allotted land.

What was true 50 years ago is true today. Without a reasonable amount of capital for permanent improvements, livestock, seed, implements, etc., the Indian owner of a piece of land cannot hope to make his living from the cultivation of the soil. To meet this pressing need, the Wheeler-Howard Act authorizes a revolving credit fund of \$10,000,000.

This fund is to supply the long-term and short-term credit requirements of some 250,000 persons. Much of it must be tied up in long-

term loans for sawmills, homes, and other improvements. Yet there is a huge demand for short-term loans to finance seasonal farm operations. The new lands to be bought for landless Indians must be improved and fenced, homes must be built, implements and seed acquired for the settlers, almost solely out of the revolving credit fund. In all probability the demands of the forthcoming year will demonstrate that it is inadequate.

THE HEIRSHIP-LAND PROBLEM

In the natural course of events, privately owned Indian lands must on the death of the owner be divided among his heirs and, in turn, among the heirs of the heirs. This result of the allotment system brings about the forced sale of Indian heirship lands, usually to white buyers. If there are no buyers, the heirship land must be leased and the proceeds distributed among the numerous heirs at an expense out of all proportion to the size of the gross revenue.

The Wheeler-Howard Act is taking the first hesitant step toward the solution of this problem. The new law, while allowing Indian owners to leave or devise their restricted land to any member of the tribe or to their heirs regardless of tribal affiliations in accordance with applicable State or Federal laws, bars the owners or heirs from selling restricted Indian lands to anyone except the tribe or the tribal corporation in the jurisdiction of which the land is located.

Obviously this negative provision, inapplicable in Oklahoma and on the Klamath Reservation, does not solve the problem. Some 7,000,000 acres are now in the heirship status; the acreage is increasing every month. The tribes have not the money with which to purchase this land. At only \$5 per acre, it would require \$35,000,000 to reacquire this land; the maximum authorized appropriation for 17½ years would be needed to return the land now in the heirship status for tribal use.

If the problem is to be solved within a reasonable time, the cooperation of the allottees and heirs must be had. They must learn that for the sake of their race and of their children they should voluntarily transfer the title to their individual holdings to the tribe or to the tribal corporation, receiving in return the same rights as they enjoy now; namely, the right to use and occupy the land and its improvements, to receive the income from the land and to leave the same rights to their children, except that the children and other heirs could not cut up the land into small, unusable pieces.

Where the land in process of inheritance has already been so divided among numerous heirs, they will have the opportunity to return the small parcels to the tribe or tribal corporation, receiving interests in the corporate property in exchange. Thus the tribe would acquire

title to now unusable land which, after consolidation, could be assigned for the use of interest-holders in tracts of usable size.

SPIRITUAL REHABILITATION

Through 50 years of "individualization", coupled with an ever-increasing amount of arbitrary supervision over the affairs of individuals and tribes so long as these individuals and tribes had any assets left, the Indians have been robbed of initiative, their spirit has been broken, their health undermined, and their native pride ground into the dust. The efforts at economic rehabilitation cannot and will not be more than partially successful unless they are accompanied by a determined simultaneous effort to rebuild the shattered morale of a subjugated people that has been taught to believe in its racial inferiority.

The Wheeler-Howard Act provides the means of destroying this inferiority complex, through those features which authorize and legalize tribal organization and incorporation, which give these tribal organizations and corporations limited but real power, and authority over their own affairs, which broaden the educational opportunities for Indians, and which give Indians a better chance to enter the Indian Service.

Even before the passage of the Wheeler-Howard bill a great spiritual stirring had become noticeable throughout the Indian country. That awakening of the racial spirit must be sustained, if the rehabilitation of the Indian people is to be successfully carried through. It is necessary to face the fact that pauperization, as the result of a century of spoliation, suppression, and paternalism, has made deep inroads. Of necessity it will take time, patience, and intelligent, sympathetic help to rebuild the Indian character where it has been broken down.

The first step in this rebuilding process must be the reorganization of the tribes, authorized by the Wheeler-Howard Act. In the past they managed their own affairs effectively whenever there was no white interference for selfish ends. They can learn to do it again under present conditions with the aid of modern organization methods, once they realize that these organizations will be permanent and will not be subject to the whims of changing administrations. These organizations, both tribal and corporate, will make many initial mistakes; there will be many complaints against shouldering the load of responsibility that accompanies authority. The task of organizing and incorporating the tribes will be difficult and laborious, calling for the maximum amount of skill, tact, firmness, and understanding on the part of the organizers. But the result should be the development of Indian leadership capable of making the Indian tribal organizations and corporations function effectively with a minimum of governmental interference.

OKLAHOMA TRIBES PENALIZED

It is to be regretted that the Oklahoma tribes, containing almost one-third of the Indians of the United States, should have been excluded by Congress from many of the important provisions of the Wheeler-Howard Act. Through this exclusion the Oklahoma Indians lose the benefit of section 2, which automatically extends the protective trust period on all restricted land; no new reservations can be established in Oklahoma; Oklahoma tribes cannot organize under the new act, nor can they form tribal corporations. Because they are denied the incorporation privilege, they cannot receive loans from the revolving credit fund, which loans can be made only to tribal corporations. It is hoped that Congress will amend the act so as extend all of the benefits of the legislation to all Oklahoma Indians.

LAW AND ORDER

The entire title creating a special court of Indian affairs was omitted and consideration of this subject adjourned until the next Congress. In view of the chaotic state of Indian law enforcement, it is important that this subject be given adequate consideration and that early remedial action be had.

INDIAN CLAIMS

Section 15 of the Wheeler-Howard Act declares that nothing in the statute shall prejudice or impair any Indian claim or suit against the United States. But this declaration does not cure the situation created by the snail-like pace of the hundreds of suits and claims by Indians against the Government. While these suits and claims remain unsettled, they will be used by designing white persons to prejudice the Indian mind against the Government, to raise false hopes of recovering fabulous sums, and by these hopes to make more difficult the task of getting the Indians to face reality and to strive in earnest to help themselves. It is hoped that the next Congress will enact legislation designed finally to settle all Indian claims in the shortest possible time.

DEFINITION OF BLOOD STATUS

An important precedent is established in section 19 of the Wheeler-Howard Act, which limits the benefits of the act to persons of Indian blood who are members of a recognized tribe under Federal jurisdiction, to descendants of such members who lived on the reservation on June 1, 1934, and to unaffiliated Indians of one-half or more Indian blood. This is the first time that the half-blood rule, effective in Canada for many years, has been even partially applied in the United States.

PROBABLE RESULTS OF THE ACT

While the Wheeler-Howard Act marks a decisive shift of direction of American Indian policy, and endeavors to give the Indians not only a broad measure of economic assistance but also those "natural rights of man" mentioned by President Roosevelt in his letter of endorsement sent to the Congress, it stops far short of the ultimate goal. It is merely a beginning in the process of liberating and rejuvenating a subjugated and exploited race living in the midst of an aggressive civilization far ahead, materially speaking, of its own. Even that beginning is oppressively difficult. To carry out the intentions of the act, to realize its potentialities even in part, and to translate them into effective action, will require the active cooperation of the Indians, the utmost of intelligent and wholly sympathetic effort by the Indian Service personnel, the assistance of many other governmental and State agencies, and continued Executive, congressional, and public support.

EDUCATION

Changes in Indian education in recent years have involved three major tasks: (a) Improving existing schools; (b) reducing and eliminating Indian boarding schools and transferring Indian children back to their own homes; (c) developing day schools that will work with adults as well as children and become real centers for Indian community life.

Strengthening of the local community day school has been the most conspicuous effort of the past year and will become even more important under the operation of the Wheeler-Howard Act.

FROM BOARDING SCHOOLS TO DAY SCHOOLS

The 1933 report described the expediting of the transfer of children away from boarding schools to day schools, as intensified by economy legislation. In comparison with the approximately 22,000 Indian children in attendance at Indian boarding schools at the close of the school year 1932, the total enrollment for 1933-34 in boarding schools was about 17,500, with an average attendance of 15,000; and the number appropriated for by Congress on a boarding basis for the new fiscal year just opening is about 13,000. This decrease of 9,000 in 2 years means that the decline of the boarding school as the dominant factor in the education of Indian children is at last an accomplished fact.

During the year under review, 10 Indian boarding schools were either abolished entirely or changed to community day schools:

The Mount Pleasant School, Mount Pleasant, Mich., was transferred by act of Congress to the State of Michigan, and the Indian children are in public

schools, some under foster-home care. The school at Rapid City, S.Dak., was closed, and most of the children returned to Sioux reservation schools, with a few to other boarding schools. From the school at Hayward, Wis., now closed, the Indian children are being accommodated in local public schools, with the eventual help of additional day school facilities furnished under the Public Works program. Indian children formerly in the Genoa Indian School, Genoa Nebr., have been absorbed in local schools, both Federal and State, in Nebraska and South Dakota. Other boarding schools were closed during the year, including Fort Belknap, Mont., where the children are to be cared for in local public schools; Mescalero, N.Mex., where a complete community program waits upon necessary home rehabilitation; Browning, Mont., where the public school authorities are taking over the total educational enterprise, including partial dormitory residence for some high school pupils not able to come every day from their homes; Red Lake, Minn., where whites and Indians are combining forces in a single large school plant now under construction with Public Works funds; Standing Rock, N.Dak., where additional new construction of day schools is taking care of most of the former boarding pupils; and Tohatchi, N. Mex., where a Navajo boarding school of some two hundred children becomes a community day school of about the same number, with transportation furnished for the children living at a distance.

The reductions made in the enrollments of Indian boarding schools are probably even more significant than actual closing of schools. Gradual dropping of elementary grades, accompanied by strengthening of the upper vocational work for older students, has transformed many of these schools. Sherman Institute, formerly estimated for on a basis of a thousand pupils, now carries 650 students, all in high-school grades. Phoenix (Ariz.) School has gone from 725 to 500 within the year; Haskell, Kans., from 900 to 600; Albuquerque, N.Mex., from 850 to 650; Chilocco, Okla., from 900 to 650.

It is not claimed, of course, that elimination of Indian pupils from boarding schools constitutes necessarily any valuable change in itself, nor that this change has been accomplished without some losses. It was, however, an essential first step that had to be taken before reconstruction of the Indian educational program in terms of basic Indian needs could go forward. Some of our Indian boarding schools undoubtedly have a place in the final plan. Some are already doing much to justify their existence by providing specialized training, and may eventually have to be better supported financially in order to do this type of work with a student body of reasonable size. There will be need for a certain amount of institutional care, apart from specialized vocational and leadership training, but it is believed that the need for this institutional care can be greatly reduced by the use of foster-home placement under adequate supervision, and our staff of school social workers is working with this possibility definitely in view.

THE NEW DAY SCHOOLS

One of the reasons why the Indian boarding school persisted in the past as the chief form of Indian education was the gross neglect of day-school possibilities. As with American rural education generally, it was customary in the Indian Service for teachers who succeeded to be "promoted" to the boarding school, and the day schools were likely to find themselves with the poorest possible teachers and other workers. In the new day-school program it is assumed that the best resources we have in personnel, equipment, and teaching materials and methods are to be at the disposal of those in charge.

In the directions given to the architects planning the day schools made possible by the Public Works allotment this year, an attempt is made to state what it is hoped these new day schools will be:

1. The schools are to be community schools of the activity type, for the use of all members of the community, adults as well as children, and the buildings should be adapted to local needs rather than conform to any conventional school plans. The simplest possible construction should be used, with local materials and Indian labor, not only for the usual reasons inherent in the Public Works program, but as part of the Indian participation in school and community work.

2. Even the smallest schools are to have a varied program. They are to be "one-teacher" rather than one-room schools—that is, there should be, in addition to the main "classroom", space for workshop, library school lunch, washing, (frequently for community washing and laundering as well as for children's use), and other needs that will develop for both pupils and community.

3. In schools larger than one-teacher schools there should be abundant space for shopwork, crafts, science, agriculture, music, home economics, library, play and assembly facilities, and such other school and community activities as are indicated in the detailed set-up for each school. A general community meeting place is to be assumed regardless of the size of the school.

Among the locations in the Indian country where central community schools are being built up are the following:

Pine Ridge, S.Dak., where the Oglala Boarding School is becoming a central school for the Pine Ridge area, with some day pupils, some on a 5-day boarding basis (returning to their homes for week-ends), and others remaining at the school on a more continuous boarding plan; Kyle and Allen, S.Dak., junior community schools from which older students will go to the Pine Ridge Central School; Rosebud, S.Dak., where a process similar to that just indicated for Pine Ridge is beginning to be developed; Cheyenne River, Greenwood, and Fort Thompson, S.Dak.; Turtle Mountain, N.Dak., where one of the first of the larger local community schools is now proving its worth; Lac du Flambeau, Wis.; Cherokee, N.C., where a central school at the agency, with local community schools at Soco, Birdtown, Big Cove, and Snowbird, will provide the school nucleus for what should be a complete tribal enterprise that will take fully into account the unusual economic and social opportunities which exist at this reservation; the Pearl River School, Choctaw Agency, Miss.; the Sacaton Central School, Pima Agency, Ariz.; the Salt River Community High School, center for the Salt River Pimas; Santa Rosa, under the Sells Agency (Papago) in Arizona; Cibicue, Ariz., under the White River Apache Agency; San Carlos, where a large number

of former boarding school pupils are on a day basis and there are real possibilities of organizing community effort; Zuni, N.Mex., where a new central high school will emphasize native arts and crafts; Taos, N.Mex., where one of the most beautiful of the new community school plants is taking shape under the hands of skilled Indian workers; and Fort Apache, Ariz., where a central Apache school is contemplated that will eventually, it is hoped, meet some of the needs of the Apaches for training in forestry, cattle-raising, and fruit-growing.

The Navajo educational program.—Need for a new type of community education is most strikingly illustrated in the Navajo area. The Navajos were the last of the Indian groups to be reached with school facilities; in the year just past not over 5,000 of the 13,000 children of school age were in school. It was long assumed that attendance of children at day schools in the Navajo country was impossible except in one or two places. Study of population movements by Supervisor R. M. Tisinger showed, however, that a plan involving small central schools, with bus and horseback transportation, would make day-school attendance possible for the vast majority of the Navajo children. Public Works funds were accordingly made available for the construction of local community day schools to accommodate some 3,000 Navajo children.

In the meantime, beginning in July 1933, a realization of the economic emergency into which the Navajos had come as the result of overgrazing and of soil erosion had led to a determined effort on the part of the Government directed toward range control, the revival of farming, and the salvaging and rehabilitation of vegetation and of soil. Clearly, any community education program would necessarily have to start from this emergency. Merely to operate conventional, or even somewhat better than conventional, schools would help but little in the face of a swiftly disappearing life and land. The problem was, and is, to operate the new day-school enterprises in direct connection with the economic situation that has to be mastered. The Navajos have been told that schools will be provided; they have also been told that these schools must do more than supply "schooling" for their children; that they are to be for adults as well; that if these community education enterprises are to succeed, they must take an active part in planning and developing them. In some instances it has been necessary to explain to them that in specified areas schools must not be built at all if they will intensify the soil erosion difficulties; again, that a school in a given location will be possible only if the herders will agree to certain safeguards intended to protect the grazing area. Workers in education and in other fields in the Navajo area have searched into the Navajo needs, economic, health, and others, to learn how the new Navajo community schools may meet, more effectively than most schools do, the real needs of the people for whom they are established. The Navajo tribal council and the

local chapters of the Navajos have participated in this work of program making.

It is likely that in many instances these community day-school locations in the Navajo country will coincide with local centers for administration. This fact and all the other factors in the total situation make plain the necessity of a program not confined to school activities as generally understood. Some 15 of the centers will be ready for operation in the fall and winter, and it is hoped that practical experience with these first ventures will help make a program that can be carried out from the central Navajo office and can unite in the educational work and the soil-saving work activities of each community.

FEDERAL-STATE RELATIONS

Passage of the Johnson-O'Malley Act in April 1934 brought to a focal point the activities of the Indian Service in establishing cooperative relations with State and local school authorities for the education of Indian children. Under the Johnson-O'Malley Act it becomes possible to contract with the States for services hitherto contracted for with hundreds and even thousands of local districts. In several States, notably California and Washington, Federal education work for Indians had already been given up, and public school authorities were handling the problem. The five small Indian day schools in the Mission country of California were abandoned last year, and Hoopa Valley had been gradually becoming a State rather than a Federal school. The California legislature had long ago passed an enabling act in anticipation of the Federal legislation. Accordingly a contract was arranged with the State department of public instruction whereby the department undertakes to provide education for Indian children in the public schools and other educational institutions of the State, Federal funds to be disbursed on the recommendation of the State department. Sherman Institute is, for the present at least, excluded from the terms of the contract.

In order to make certain that homogeneous Indian communities like Fort Yuma, in the southernmost part of the State, will not be deprived of their distinctive character and their opportunities under the Wheeler-Howard Act, the following provision was agreed upon and written into the contract:

[The State of California agrees] to afford special courses to Indian arts and crafts, physical and health education; and, in distinctly Indian communities, to provide an educational program designed to meet the special needs of the Indians, this program to be adopted and carried out, wherever feasible, with the advice of anthropologists acquainted with the particular Indian group and after consultation with recognized representatives of the Indians, to the end that the program shall take adequately into account the Indian community life, shall be based on Indian economic, health, and social needs, and shall encourage Indian participation.

In Washington State no strictly Federal schools for Indian children now exist, all the Indian children being accommodated in regular public schools, and the passage of the Johnson-O'Malley Act will hasten a State-wide arrangement similar to that made in California.

It should be understood that the Indian Service is not planning to turn over extensive and important Indian educational work to the States or their subdivisions except where careful preparations have been made. Most of the hoped-for gains accompanying the change from boarding schools to day schools and public schools eventuate only when adequate replacement arrangements are set up. In Nebraska, for example, where we closed the Genoa Boarding School, the total number of Indian children attending school has increased from 985 to 1,372, but increased attendance has proved to be not the only advantage. At the Winnebago-Omaha Agency, where most of these Indian children are, we have been able to provide social workers to help with the families, and a physical-education man to direct recreational activities; we have helped the local schools to introduce shop work and strengthen home economics—to the manifest advantage of white and Indian children alike—and we have increased the provision for institutional care of children who were in need of such care; all at a cost far below that of the boarding school.

We recognize, of course, that the poorer public schools are likely to be where the Indians are; that these schools have been especially hard-hit by the depression; and that in difficult financial times such schools, even more than schools elsewhere, tend to drop from their program certain of those newer elements—health and physical education, shop work, home economics, art, music—which constitute the real fundamentals. To the extent that we have been able to strengthen our Federal Indian schools in these respects (and we have made real progress here) we are naturally reluctant to turn over Indian children to local public schools unless we can get some assurance that a modern type of education will be provided. On the other hand, if we can, by the method of paying tuition for Indian children, demand and obtain desirable educational activities that would otherwise not be forthcoming, there would seem to be justification for taking the step in the interest of both Indian and white children.

HEALTH EDUCATION

One of the distinct achievements of the year is the establishment of the position of supervisor of health education and the securing of a well-known specialist in this field, Miss Sally Lucas Jean, to organize a health education program under the joint auspices of the divisions of health and education. Through the initiative of this supervisor and the cooperation of the health division, a Navajo nurse-aids institute

was held at the Santa Fe Indian school in June 1934, and of the 98 Navajo young women who attended, 25 were declared eligible for appointment as nurse-aids in the new Navajo day school centers. A specialist on health curriculum was also retained for temporary service in assisting members of the education staff of the Service in preparing materials for Indian schools on health.

INDIAN RELIGION, MISSIONS, AND THE SCHOOLS

For many years, anthropologists and other students of Indian affairs have been distressed at a strong tendency in the Indian schools to impress upon Indian children that Indian customs, Indian language, and Indian ways of living were necessarily bad and must be completely uprooted as part of the educational process. In an effort to counteract this tendency and set up standards of appreciation of the worthwhile things in Indian life, Circular 2970 was issued in January 1934. Calling attention to the fact that some Indian Service officials and employees, some missionaries, and many Indians are unsympathetic to Indian religious expressions, ceremonial and art expression of Indians, and the use of Indian native languages, the Commissioner's circular says:

There are Government schools into which no trace of Indian symbolism or art or craft expression has been permitted to enter. There are large numbers of Indians who believe that their native religious life and Indian culture are frowned upon by the Government, if not actually banned.

Accordingly—

No interference with Indian religious life or expression will hereafter be tolerated. The cultural history of Indians is in all respects to be considered equal to that of any non-Indian group. And it is desirable that Indians be bilingual—fluent and literate in the English language, and fluent in their vital, beautiful, and efficient native languages * * *. The Indian arts are to be prized, nourished, and honored.

Religious instruction.—Appreciation of Indian culture does not mean that there is any intention of interfering unduly with intelligent and devoted mission effort on the part of Catholic or Protestant workers in the Indian field. It is felt that there is a valuable service to be rendered by the missions, especially in providing institutional care for certain types of underprivileged children. The school regulations covering "religious worship and instruction" were amended in January 1934 in such a way as to permit the use of boarding school premises for religious instruction, but at the same time to require specific direction from the parent and to forbid compulsion in the case of any child. As to day schools, the new regulations provide that children shall be excused for religious instruction for 1 hour a week upon the request of the parents, and that "while religious exercises are not to be held in the premises of day schools during regular

school hours," facilities at the day school may be provided "for the use of religious instructors at times and under conditions not in conflict with the uses of the building by the Indian Service or the community."

TRAINING OPPORTUNITIES AND INDIAN EMPLOYMENT

The educational loan provisions of the Wheeler-Howard Act give special point to what has so far been done in the advanced vocational and technical training of Indian youth for positions in the Indian Service and elsewhere. In 1933-34 there were 515 Indian students enrolled in colleges and universities throughout the United States, of whom 168 were assisted by Federal or tribal funds and 17 were on private scholarships secured through the efforts of the Indian Office. Among the professional and advanced vocational courses represented were: Teaching, 49; physical education, 19; home economics, 12; nursing, 11; agriculture, 8; art, 5; music, 5; medicine, 5; civil engineering, 5; law, 5; forestry, 3; electrical engineering, 3; architecture, 3; social service, 3.

Surveys have been carried on during the past year in Washington, Oregon, Montana, Idaho, and northern California, to provide authentic information on which to determine the need and kinds of vocational training for Indian youth of the Northwest.

Placement and guidance work for girls and women has continued in operation at Los Angeles, Phoenix, Kansas City, and Tucson. In Oakland, Calif., a cooperative arrangement has been worked out with the Young Women's Christian Association.

EDUCATION FOR NATIVES OF ALASKA

The work of education for natives of Alaska, brought over as a separate activity into the Indian Service in 1931, has gradually tended to become part of the total program of Indian education under the Indian Service. In certain of its features, however, it remains distinct. The need for suitable supervision and for in-service training of teachers and workers led this past year to the inauguration of a summer demonstration school for the teachers of northern Alaska and the provision of a supervisor of elementary education for the southeastern area. Schools in isolated Alaska villages necessarily serve as community centers for many of the village activities, and upon the school and the teachers falls the duty of aiding in the solution of many communal and individual problems not always thought of as educational, nor always with a counterpart in regions outside of Alaska.

Needs for the immediate future, as seen by the director of education for natives of Alaska, are a continuation of the effort to evolve an

educational approach integrated with local needs, the establishment of a working relationship between Federal and Territorial schools, increased participation of native village organizations in school matters, extensive building replacements and repairs, additional educational supplies and materials, further supervision and aid in education, social welfare, and economic advancement, and the extension of the educational services into untouched villages, especially in the Yukon-Kuskokwim Delta area and along the coast line east of Point Barrow. The Federal Government is, as yet, a niggardly guardian over the Alaskan Indians.

HEALTH

Tuberculosis, trachoma, and venereal disease continue as the principal Indian health scourges.

Statistics on the tuberculosis rate have never been reliable, but general examinations and surveys indicate that there is at least ten times more tuberculosis among Indians than among whites. Our tuberculosis sanatoria are totally inadequate to cope with the situation and to provide for the removal of open infective cases from the home. A special physician for tuberculosis work was appointed this year. It is only a beginning, but it is believed that the results of his work will justify the employment of many more. It is impossible, due to economy requirements, to provide hospitalization for all those needing it, but it is feasible to teach ordinary public health and preventive measures in the homes.

Trachoma is still prevalent to a grave extent. The treatment of trachoma has been carried on primarily by a small corps of 11 special physicians. More are needed; however, we are emphasizing the teaching of operative procedures and after-treatment technique by these special physicians to the local agency and hospital physicians.

As yet, practically no public health work has been done toward the prevention of venereal disease. It is earnestly hoped that in the near future special physicians can be appointed to work toward the prevention of these diseases. Education in social hygiene, within and without the Indian schools and hospitals, is as yet almost wholly a thing of the future.

INCREASING WORK WITH DECREASING BUDGET

Health personnel in 1932, exclusive of supervisory personnel, some of which is detailed from the Public Health Service, consisted of 217 physicians, 401 hospital, field, and special nurses, 15 dentists, and 643 employees principally engaged in institutional work. The comparable numbers for 1934 are 216, 393, 16, and 644 respectively. Appropriations actually were decreased by \$369,650 during this

2-year period, notwithstanding the critical need for this type of service to the Indians. Exclusive of construction, \$3,783,000 was provided for 1932, and only \$3,413,350 for 1934. These latter amounts include tribal funds and appropriations for the Alaskan medical work.

The increase of work done, and of overwork, is illustrated by the rise in hospital days from 508,050 in 1927 to 1,078,881 in 1933, and by the increase in out-patient treatments at hospitals from 703,141 in 1927 to 1,432,254 in 1933.

COOPERATION FROM PUBLIC HEALTH SERVICE

The Public Health Service has continued the detail of various personnel to the Indian Service. Routine investigations of water supplies, sewage disposal, milk production, and all problems requiring technical advice of the sanitary engineers have been continued as in the past by the detail of sanitary engineers by the Public Health Service.

The Committee on Indian Affairs of the State and Provincial Health Authorities of North America is continuing its active support in developing cooperative relationships in the Indian Field Service at various state and local health agencies.

THE JOHNSON-O'MALLEY ACT AND HEALTH

Public health activities have been stimulated by the Johnson-O'Malley Act, whose provisions are explained in the section on education. Whenever possible, cooperative relationships are being entered into which local health authorities, looking toward the provision of a well-rounded public health program reaching Indians and whites alike. During the year two such agreements have been made. One is with the State of North Carolina, and under its provisions, the State Board of Health, the Public Health Service and the Indian Office have organized a health district comprising the three counties in which the Eastern Cherokee Indians live. This district is now operating as a unit, with good results. In preparation for this agreement, a general health survey of the Cherokee people was carried out during the preceding fiscal year.

The other cooperative agreement is with the State of Florida. Under its terms, one public health nurse has been assigned by the Indian Office to the State Board of Health of Florida for work among the Seminole Indians. This practically is the beginning of health work in behalf of the Seminoles.

NEW HOSPITALS

Public Works grants have been secured to construct eleven new Indian Service hospitals and to make improvements at ten existing

hospitals. In addition, the Albuquerque Tuberculosis Sanatorium was opened for patients about January 1, 1934.

It is encouraging to visualize the functioning of additional hospitals in the Indian Service. However, the supply of hospital beds remains far under the demand, since Indians more and more are taking advantage of hospital facilities. The increase of hospital days, etc., has been previously mentioned.

NURSING SERVICE

During the past fiscal year the Health division continued to be greatly handicapped by the present slow procedure in employing nurses.

Sixty-seven appointments and 71 separations were made. This tremendous turnover, which has been averaging 80 percent, may be compared with the rate of 7 percent in the Army and 11 percent for the Navy. The reason for this disastrous turnover is readily apparent. Comparison of the Indian Service's quota of nurses to patients with that provided by other Government services follows:

	Nurses	Attendants
Veterans' Administration.....	1 to 8 patients.....	1 to 6.5 patients.
Public Health Service.....	1 to 9 patients.....	1 to 2.3 patients.
Army.....	1 to 10 patients.....	1 to 1.7 patients.
Navy.....	1 to 20 1 patients.....	(1)
Indian Service.....	1 to 14.8 patients.....	1 to 11 patients.

¹ These are all supervisory nurses, the corpsmen doing the routine ward work.

Indian Service nurses work, on the average, from 58 to 66 hours a week. The work-week of nurses in other services is from 40 to 48 hours.

The results are obvious—long hours, overwork, physical breakdown, making it quite impossible to maintain and operate an efficient nursing service. Through special efforts made during the last session of Congress, a sum was obtained for employing 45 additional nurses. Relief sought for several years has finally been obtained in part. However, the work-week for nursing personnel has not been greatly diminished.

An additional burden to the hospital nurse is the necessity of doing heavy clerical work.

Ninety-three public health nurses in the field are the nucleus for our public-health programs. The success of their work has created a demand for additional public-health nurses.

The supervisory service over this field force is utterly inadequate. It is now possible for the supervisor of nurses to visit each nurse only once every several years. With our new program of public health developing as it is, a more extensive supervisory service must be attempted.

DENTAL SERVICE

Inadequate personnel, the isolation and scattered distribution of the Indian population, and the lack of local facilities for furnishing dental treatment, make it impossible to provide an adequate dental service for more than a small percentage of the Indians. There are 11 whole-time and 14 part-time dentists for all the Indians of the United States and the natives of Alaska.

CRIPPLED CHILDREN

During the fiscal year an attempt was made to learn the number of crippled Indian children. The result is a statistical file in the office of the Health Division, giving the names, ages, and addresses, with a diagnosis, of 770 crippled Indian children. Most of these deformities are due to congenital dislocations of the hip and tuberculosis. Many need immediate treatment. If taken in time many of these conditions, especially the congenital dislocations, can be cured. We deeply hope that steps can be taken to start some sort of remedial work.

PERSONNEL

Dr. M. C. Guthrie, director of health, was relieved by Senior Surgeon J. G. Townsend, United States Public Health Service, on December 28, 1933.

Dr. F. I. Proctor has been appointed as consultant in trachoma, at \$1 a year.

Dr. W. W. Peter has been appointed as chief health officer and director of medical activities for the Navajo area.

ALASKA MEDICAL SERVICE

For the 29,983 Indians and Eskimos of Alaska, we have a medical force of a director, 6 full-time physicians, 5 part-time physicians, 1 traveling dentist, 15 hospital nurses, 23 public health village nurses, and 32 minor employees, making a total of 82.

Mention should be made of, and credit given to, the United States Coast Guard, whose officers, physicians and dentists in Alaska have extended their facilities most cordially to the Indian Service and have themselves rendered valuable medical and dental assistance to the natives at villages reached by the Coast Guard vessels.

Tuberculosis continues to be the most prevalent disease among the natives. Facilities for its prevention and care are sadly inadequate. There is urgent immediate need for the construction of hospitals at Ketchikan, Seward, and Bethel, for the replacement of the present inadequate hospital at Kanakanak, and for the addition of a tuberculosis wing to the hospital at Kotzebue. Additional traveling public

health nurses are also needed to instruct the natives in disease prevention, in sanitation, and in child care; to provide follow-up work for discharged hospital cases; and to work for immunization against contagious and infectious diseases.

Concerning whole populations of natives in Alaska, it can be said: A modern health service must be furnished them if they are to survive; only a beginning as yet has been made.

INDIAN LAND

The activities of the land division involve matters of so varied a nature as to preclude describing them in detail in this report. These activities include work in land acquisition, mineral rights and leases, allotments of land in severalty, enrollment of individual Indians, tribal litigation in the Court of Claims, legislation, and hunting and fishing rights.

LAND ACQUISITION

Pursuant to the act of June 14, 1934 (Public No. 352), approximately 1,000,000 acres will be added to the Navajo Indian Reservation in Arizona. This acreage consists of public domain interspersed with privately owned lands. The latter are to be acquired through exchange and purchase as authorized by the act. The passage of this act is another step forward in completing plans formulated 2½ years ago for rounding out the then existing Navajo Reservation. Three steps were involved. The first was the acquisition of the so-called "Paiute Strip", and the second step was the rounding out of the boundary line in Arizona. These two steps have been consummated, and the remaining step, which is to round out the reservation boundary in New Mexico, will no doubt be accomplished within the coming legislative year. A bill for that purpose was introduced during the last session of Congress and was passed in the Senate and was before the House for consideration at the time the last Congress adjourned.

Legislation was obtained, embodied in the act of May 23, 1934 (Public No. 247, 73d Cong.), authorizing the exchange and consolidation of Indian and privately owned lands within the checkerboard area reserved as an addition to the Fort Mojave Reservation by Executive order of February 2, 1911.

Under authority of the act of June 7, 1924 (43 Stat. 636) as amended by the act of May 31, 1933 (48 Stat. 108), the following purchases of land within certain Pueblo reservations in New Mexico have been made during the past year.

Pueblo	Area in acres	Cost
Nambe (4 separate tracts).....	33.89	\$3,460
Santo Domingo.....	13.38	1,000

Several purchases for the benefit of other Pueblos are pending.

Pursuant to section 3 of the act of May 31, 1933 (48 Stat. 108), regulations were promulgated September 28, 1933, governing the disbursement of compensation to white settlers or non-Indian claimants within the various pueblos, who were found by the Pueblo Lands Board to have occupied and claimed land in good faith but whose claim to title was not sustained by the board. Payment has been made to practically all of the claimants, except in a few cases where the claimant is deceased and the heirs are undetermined; also in a few cases where the claimant has appealed from the award made by the board. Appropriate action to clear such cases is being taken.

Just before the end of the fiscal year the Indian Office received tentative approval for the purchase of a half million acres of land under the submarginal land-purchase program. A staff was organized and began work in the field before the close of the year.

SUBSISTENCE HOMESTEADS

Late in the fiscal year, the Indian Service received tentative approval from the Subsistence Homestead Division of the Department of the Interior to construct five or six Indian homestead projects under the provisions of section 208 of the National Industrial Recovery Act, approved June 16, 1933. Studies were immediately started and plans developed for procedure on this work.

MINERALS

The last fiscal year marked the extension of the Cut Bank oil field into the eastern side of the Blackfeet Indian Reservation in Montana. This field, now definitely established, is perhaps the largest potential oil-producing area in the world and may yield the Blackfeet Indians a substantial royalty income for a number of years. Under the terms of existing leases a number of additional wells within the boundaries of the Indian reservation in this field are to be drilled during the coming year, in response to insistent demands of the Blackfeet Tribal Council. The oil is a very good grade of light oil of about 40° A.P.I. gravity. Most of the crude oil is marketed in Canada. So far, no dry holes have been drilled in this field. The wells are not large producers, the initial production ranging from about 30 barrels per day to 150 barrels per day. Construction work has been started on a new pipe line from the Cut Bank field to Coutts, Alberta, Canada. The line will be a welded line of about 30 miles in length. One 80,000-barrel tank and two 10,000-barrel tanks are to be erected.

The Maverick Springs field, Shoshone Reservation, Wyo., remained practically dormant during the year. There is a very limited demand for the oil produced from this field, which is a heavy black oil of low gravity, although a very good road oil.

The tribal lease in the Soap Creek oil field, Crow Reservation, Mont., has been assigned and a new well is being drilled further to test this field. This is the first drilling activity in this area since the original discovery wells were completed approximately 12 years ago. The oil from this field is also heavy black oil of low gravity, valuable principally for road-building purposes. A unit plan of operation has been arranged among the several lessees in the Soap Creek field, and it is probable that it may yet prove to be of considerable value to the Indians and the operators as well.

New oil-producing areas of considerable proportions were proved in the Osage Reservation during the year. Considerable increased interest in Osage leases was thereby revived, and the economic status of the Osage Tribe has been materially improved. A plan for operating and developing the areas has been approved by the Petroleum Administrative Board and is being carried out through cooperation with the Oklahoma State Corporation Commission.

The Osage Tribal Council has employed attorneys with the approval of the Department to attempt to recover alleged excessive deductions for impurities in oil made by purchasing companies over and above actual losses sustained by them. The claim, if substantiated, may recover several millions of dollars.

Further repressuring experimentation by the injection of gas into the partially exhausted oil sands was approved during the year and resulted in a considerable increase in production of oil from the Wilcox sand in Oklahoma fields. The result indicates a very favorable outlook, and doubtless pressure restoration to increase recovery will be resorted to in other wells producing from the Wilcox sand.

There are about 1,036 producing leases of restricted allotted Indian lands in Oklahoma, and, including the 9,371 producing tribal Osage wells, there are in the State of Oklahoma a total of 14,188 producing oil and gas wells on restricted Indian lands. Approximately one-half million acres are under lease, besides practically the entire Osage Reservation which is leased for gas-mining purposes.

There are now 33 producing wells on the Navajo Reservation in New Mexico. Over \$1,000,000 has been received in royalties since their initial discovery approximately 13 years ago.

Forty-two coal mines were under active operation covering lands under the jurisdiction of the Five Civilized Tribes Agency, and 388,094 tons of coal were mined, producing an income of \$49,696.29. Public Works Project No. 63, operating within the area of the Choctaw and Chickasaw segregated coal lands for the purpose of controlling surface and subsurface water, was assigned to the United States Geological Survey engineer in charge of the coal mines in this district. The benefits to these coal lands are very gratifying.

During the fiscal year 1934 there was an average of 17 large mine, ore, and tailing mills in operation on restricted Quapaw Indian lands, as compared with 6 such mills during the prior fiscal year. These mills constituted 42 percent of the average number of mills in operation in the tri-State district for the year. The total value of lead and zinc concentrates mined and sold from these lands was \$2,568,307.39. The Indians' royalties amounted to \$245,842.23. Considerable beneficial work was done in these lead and zinc mining fields, also under Public Works Project No. 63-Q, in the control of surface and subsurface water.

ALLOTMENTS

The policy of this administration has been opposed to the further allotment in severalty of reservation lands. The Wheeler-Howard Act, passed June 18, 1934, (Public, No. 383, 73d Cong.) repealed all existing allotment laws and effectively puts an end to the making of further allotments from existing tribal lands.

During the early part of the fiscal year 1934, due to valid rights previously initiated, a total of 48 individual Indians were allotted 1,421.55 acres of tribal lands as follows:

Reservation	Number of allotments	Acreage
Hoop Valley, Calif.....	40	638.25
White Earth, Minn.....	1	160.00
Standing Rock, N.Dak.....	1	159.13
Quinaiaelt.....	6	464.17
Total.....	48	1,421.55

In addition, allotments were made to eight individual Indians on the public domain and in national forests, embracing a total of 835.68 acres. The prohibition against further allotments contained in the Wheeler-Howard Act does not apply to Indians living on the public domain or in national forests.

During the past year 25 fee patents, issued during the trust period without application from the individual Indian, have been canceled under authority of the acts of February 26, 1927 (44 Stat. 1247) and February 21, 1931 (46 Stat. 1205), bringing the total number of such cancelations to 401. In addition, several patents have been canceled during the past year by decrees of the Federal courts as the result of suits brought by the Federal Government. In one of these suits, the sum of \$986.26 was recovered for the benefit of the allottee, representing taxes paid by her (*United States v. Comanche County, Oklahoma*, 6 Fed. Supp. 401). Other suits have been instituted, involving approximately 50 allotments, and 60 additional cases are about ready to be submitted to the Department of Justice for appropriate action.

Interpretation of the Mexican Kickapoo Act of June 21, 1906 (34 Stat. 325-363) finally reached the Supreme Court of the United States, and a decision favorable to the Government was handed down on November 6, 1933, which, it is expected, will be the basis for a number of suits to clear title to Mexican Kickapoo allotments (*United States v. F. H. Reily*, 290 U.S. 33).

Steps have been taken to obtain from the field the necessary information as to land values, preparatory to making appropriate recommendation to Congress on account of claims for "Lost allotments" for the Sioux Indians, which have been adjudicated under the act of May 3, 1928 (45 Stat.L., 484). The original plan was to make allotments in such cases where land was available which could be used for the purpose; but in view of the prohibition against allotments embodied in the Wheeler-Howard Act, it will be necessary to obtain appropriations sufficient to cover all claims of this nature.

LITIGATION

Comprehensive reports were submitted to the Department of Justice on six cases in the Court of Claims against the United States: the Nez Perce case, no. K-107; the California case, no. K-344; the Ponca Indians of Oklahoma and Nebraska, no. L-4; the Quinaielt case, no. L-23; the Warm Springs case, no. M-112; and the Northwestern Shoshone case, no. M-167.

Reports were prepared and were pending June 30 on the Pillager Indian case, no. M-387; and the Saginaw, Swan Creek, and Black River case, no. H-211.

Another report, which had been prepared and was pending June 30, was on a tentative stipulation of facts in Chippewa case no. H-192. The report was not signed, however, until July 19, 1934.

A tribal roll of the Uintah, White River, and Uncompahgre Bands of Ute Indians of the Uintah and Ouray Agency, Utah, was approved, for the purpose of paying out about \$1,000,000 appropriated for these Indians, under the act of February 13, 1931 (46 Stat.L., 1092), to cover certain claims, in lieu of submitting the claims to the United States Court of Claims for adjudication.

The Five Civilized Tribes have filed in the aggregate 59 suits against the United States in the Court of Claims, in which were set forth the claims of these tribes against the United States aggregating more than \$500,000,000. Of these suits, 17 were instituted by the Creek Nation, 11 by the Seminole Nation, 9 by the Cherokee Nation, 1 by the Eastern or Emigrant Cherokee group, 1 by the Old Settler or Western Cherokee group, 3 by the Eastern or Emigrant Cherokee group and Old Settler or Western Cherokee group jointly, 5 by the Choctaw Nation, 5 by the Chickasaw Nation, and 7 by the Choctaw and Chickasaw Nations jointly.

Of the above-mentioned 59 suits, the Court of Claims, prior to this fiscal year, rendered decisions adverse to the Indian nations in 4 cases, and in 2 other cases dismissed the petitions at the request of the plaintiff Indian nations. In two of the cases in which adverse decisions to the Indian nations had been rendered, the court has permitted the cases to be reopened and amended petitions filed. During the present fiscal year the Court of Claims rendered decisions adverse to the Indian nations in two cases but later permitted one of the cases to be reopened and amended petitions filed. Two other cases were dismissed on request of the plaintiff Indian nations. On March 13, 1933, the Court of Claims rendered a decision in favor of the Creek Nation in one case in the net sum of \$86,823.19, but the Supreme Court of the United States on April 11, 1934, granted to the United States a writ of certiorari to said court where the case is now pending. On December 4, 1933, the Court of Claims rendered decision in another case in favor of the Creek Indian Nation in the sum of \$144,106.01. No further action was taken on behalf of the United States in this case, and an appropriation (act of June 19, 1934, Public, 412, 73d Cong.) was made for payment of the judgment of the court. There are 49 cases now pending in the Court of Claims and one case pending in the Supreme Court of the United States.

The Department of the Interior furnished during the present fiscal year 11 reports to the Attorney General relative to these suits and the matters involved. Prior to the present fiscal year 15 reports were furnished the Attorney General concerning these pending cases and the matters involved. Reports for the information of the Attorney General as to other pending suits and the matters involved are in course of preparation.

PROBATE WORK

This division is made up of 4 professional employees in the Washington office, 16 in the various reservations, and 7 probate attorneys in Oklahoma.

Its function is to probate the estates of all Indians who die leaving trust property. Here the Indian is followed from the cradle to the grave, and in the division of his material wealth all his sins and virtues are exposed to view. At the present moment, estates originating from the Civil War are now being determined, and the legal and social customs of the Indian during all that period enter into each case.

During the past year the heirs have been determined in 2,092 estates; yet the work is never up to date. This division is the clearing house for all inquiries relative to Indian estates. Senators, Congressmen, prospective heirs, beneficiaries under wills, and the general public claim daily attention.

Probate work is done for the Indian at minimum expense, estates valued at less than \$250 carrying no fee. The minimum fee is \$20, and no fee in excess of \$75 may be charged regardless of the value of the estate. Because of the volume of work, these small fees make the division practically self-sustaining.

All decrees and final orders relative to these estates, save those of the Five Civilized Tribes of Oklahoma, must have the approval of the Secretary of the Interior. From his decision there is no appeal. Consequently the work of the experts of this division is most exacting. Careful reviews of each case are made to prevent error, and should one creep in, the Secretary may and does, either on application or of his own motion, remedy the situation.

On July 1, 1934, the entire Probate Division was transferred to the Solicitor of the Secretary's Office, including the seven probate attorneys in Oklahoma. Under the act of January 27, 1933 (Pub., 322, 72d Cong.), these attorneys are restored to jurisdiction over all probate proceedings in their respective districts.

EMERGENCY CONSERVATION WORK

Emergency Conservation Work was set up by the act of March 31, 1933, but since funds were not available until June 20, work did not begin, except on a few reservations, until July 1933. Regulations were liberalized to give to the Indian Service the supervision over this work on Indian reservations, including the disbursement of funds and employment of personnel.

FUNDS

A total of \$12,375,200 has been allotted. Of this amount \$11,091,872 was allotted to field units. The balance was retained for future allotments, and to supplement the amount made available for the fiscal year 1935.

ENROLLMENT—EMPLOYMENT

Enrollment was open to Indians over 18 years of age able to perform ordinary labor and free from communicable disease.

The maximum number of enrolled men on the pay roll at any one time was about 13,000. For the entire year, July 1933 to June 30, 1934, the average monthly number of enrolled men employed is 9,600. However, through the "staggering" of employment the number of Indians put at work in the months of maximum employment was 20,833. Some of the agencies staggered employment so effectively that it is quite possible that some 25,000 different Indians were on the Indian emergency conservation work pay rolls at one time or another during the year. This would indicate that

approximately 80,000 to 100,000 Indians have benefited from emergency conservation work.

The number of supervisory jobs has been kept under strict control. Indians were given preference from the outset in filling all such jobs; and they have taken over as rapidly as they could be trained. It was necessary in addition to employ technically trained men, such as foresters and engineers. Few Indians could qualify for these positions. However, a large number of group foremen, mechanics, machine operators, camp assistants, assistants, and assistant foremen have been Indians. Regular forestry employees of the Indian Service supervised emergency conservation work for several months. As their own work suffered on this account, it was necessary for us to get qualified men to relieve them, thus enabling the forestry men to return in part to their regular duties.

The following table shows the number of Indians and non-Indians in supervisory and facilitating positions:

	Indians	Non-Indians	Total
November 1933.....	404	560	964
December.....	358	462	820
January 1934.....	366	496	862
February.....	381	383	764
March.....	455	385	840
April.....	523	402	925
May.....	555	454	1,009
June.....	604	469	1,073

Under the liberalized plan approved by Director Fechner, Indians were permitted to work from their own camps or from their homes, according to choice. The rate of pay for Indians was the same as that given whites in the C.C.C. camps, a cash allowance of \$30 per month, with quarters and food if camps were provided. Indians were even permitted to work on a day basis. Work was limited to 20 days per month, at \$1.50 per day, to keep within the cash allowance of \$30 per month authorized by the President. Where it was not desirable to establish camps, Director Fechner authorized the Indian Office to pay each Indian, not provided with quarters and subsistence, the commutation allowance of 60 cents per day. Thus, if an Indian was lodged and subsisted by the Government he received \$30 per month cash; if he lived at home and subsisted himself, he received \$42 per month, or payment at the rate of \$2.10 per day for each day worked less than the monthly maximum of 20 days.

The family camp was an interesting development. Indian families moved their tents close to work projects. As they furnished their own quarters and subsisted themselves, they received commutation of quarters and subsistence. This arrangement cost the Government much less than the construction, equipment, and maintenance of camps.

HEALTH—ACCIDENTS

The health of the Indians has been enormously benefited, a natural consequence of healthy outdoor work and good food. At the start, the expense of feeding the Indians was quite high, but we made no effort to check it, realizing that sooner or later the Indian appetite would adjust itself. From many reservations we have had reports that the average weight increase was from 5 to 8 pounds per man, solid flesh and muscle, due to good food and healthful occupation. On the Osage Reservation in Oklahoma an amusing contrast is shown—many of the Indians actually lost weight and benefited by it.

Reports of accidents and illnesses on the various reservations through March 31, 1934, showed only 7 cases of illness and 44 minor accidents. These reports are undoubtedly incomplete, however. But 13 deaths were reported and 4 of these were not work-connected.

PRODUCTION ACCOMPLISHMENTS

The achievements by Indians in this campaign of hard manual work are among the proud exploits of their race. During the fiscal year, Indians in the Indian emergency conservation work completed the following major quantities of new construction at 78 jurisdictions in 22 States—besides heavy maintenance work and an array of miscellaneous items of new construction:

<i>Forestry</i>		<i>Range improvement</i>	
Telephone lines.....miles..	2, 060	Check dams (erosion).....units..	25, 439
Truck or horse trails....do....	2, 772	Stock water reservoirs....do....	1, 067
Bridges.....units....	415	Springs and wells developed	
Fire lanes.....miles....	543	.....units..	1, 042
Trailside clearing.....do....	810	Corrals.....do....	66
Stand improvement or reduction		Range and other fences.....miles..	2, 558
of fire hazards.....square miles..	15	Driveways for stock....do....	166
Insect pest (tree).....do....	49	Rodent control.....square miles..	4, 795
Fighting forest fires		Elimination of useless range	
man-days..	22, 169	stock.....head..	46, 972

The benefits to the Indians physically and morally have been incalculable. The benefits to the reservations have materially increased the value of the Indian holdings. It is difficult to estimate the actual increase. In some instances it will not be fully measurable until years have passed, but we believe the immediate benefits in money values are greater than the amount of money expended for such improvements.

Tribal authorities have passed upon the projects, wherever tribal organization existed.

DISBURSEMENTS

Of the sums disbursed by the Indian emergency conservation work through March 31, 1934, pay roll (including shelter and subsistence or commutation thereof, and team hire with services) accounted for 72.73 percent; purchases of heavy equipment accounted for 6.12 percent; while purchases of supplies for field work accounted for 11.40 percent. Of the total pay roll, 86.86 percent went to Indian enrolled men or to Indian supervisors and skilled laborers. All but 16.09 percent of the total pay roll went to enrolled men. Purchases of expensive equipment were kept to a minimum consistent with efficient work.

LEADER TRAINING CAMPS

Four leader camps were established—one each at Yakima, Mescalero, Fort Apache, and Western Navajo. Two hundred and twenty-two Indians were enrolled at the 4 camps; 211 finished the course and received final rating. These leader camps appear to be well worth while, and if conditions permit we hope to have at least four more during the coming year.

The Indians earned and learned. Projects were soil erosion, forestation, and kindred subjects.

MISCELLANEOUS

The training of Indians for leadership has been a major objective from the first. The set-up has been arranged so that gradual steps may be taken by Indians. The enrolled man may be promoted to assistant leader at \$36; then to leader at \$45; to subforeman at \$100 gross; to assistant foreman at \$135 gross; to group foreman, maximum \$167 gross. Project managerships are also available. There were about 1,560 assistant leaders and leaders on June 30, 1934.

Wages of Indians have been saved by withholding, in many instances, part of the earnings. Approximately \$500,000 was withheld up to March 31, 1934. This reserve will prove invaluable to the Indians later on.

Director Fechner has given sympathetic consideration to every request made by us and has cordially cooperated in advancing the work.

"INDIANS AT WORK"

The mimeographed semimonthly magazine, *Indians at Work*, has been in increasing demand, not only by Indians and Indian Service personnel, but also by schools, organizations, and individual friends of Indians.

FORESTRY

The work of the Forestry Division embraces the administration of about 8 million acres of forest land and about 36 million acres of range land. These two activities are both aspects of land conservation. They overlap on most of the reservations where there is any timber, for the practice of silviculture directly affects the character of the forage, while the degree of range control is often a determining factor in the success of the silviculture.

The fundamental objective of both forest and range management in the Indian Office is to use these natural resources in a way which will preserve their productivity and at the same time furnish the maximum possible economic and social benefit to the Indians. Our administration of these resources during the fiscal year of 1934 has been more successful in the former than in the latter respect.

LOGGING OPERATIONS

There have been active logging operations on the White River Apache, Klamath, Colville, Menominee, Neah Bay, and Quinalt Reservations. On the first two reservations the silvicultural practice has been excellent; on the third it has been as good as possible with a very difficult stand of timber with which to work; on the fourth we have cut much too heavily, but plan to remedy this malpractice during the coming year; on the fifth and sixth we have clear-cut the forest, as everyone else in the huge Puget Sound timber does, but we are going to stop this disastrous practice, even though we shall have to work out new methods of selective cutting.

GRAZING MANAGEMENT

Grazing of more than domestic stock takes place on over 50 different reservations. So far as we have yet heard about or observed there is serious overgrazing on only three. These are the Navajo, Hopi, and Papago. In each case the stock is owned by the Indians themselves, and this makes stock reduction much more difficult than would be the case if the range were used by outside lessees. Disaster from erosion and forage destruction are inevitable if we do not make large stock reductions promptly.

Thoroughly effective grazing management is almost impossible when the range is broken up into the large number of small allotments which characterize almost all of the grazing reservations except those in the Southwest. The Wheeler-Howard Act stops further allotments but does not provide any very speedy means of restoring the present broken-up grazing lands into large, singly owned units. To overcome the difficulty of divided ownership in natural range units the power-of-attorney system was devised several years ago by

which individual Indians gave the superintendent the right to grant permits for the use of their land. This worked splendidly where the Indians were satisfied with it, but some tribes, notably the Crows and Blackfeet, did not want to give the superintendent so much power. To meet their complaint we have devised a new system, by which individual Indians will be given a restricted privilege to lease their land to the high bidder on the unit of which their allotment is a part for not less than the bid price, and subject to all grazing regulations. This gives us the two things we are after: solid units and range control. It also gives the Crows and Blackfeet what they want—direct dealing with the lessee.

INDIAN OPERATION SOUGHT

We are still falling down badly in helping the Indians to get the maximum economic and social value for their forest and range. This necessitates that they should use it themselves instead of leasing the privilege to someone else. Using their own resources would give the Indians a much larger income than at present, for they could not only receive the value of their stumpage prices or grazing fees, but also they would make wages; and if their enterprises were properly managed they should be able to make at least as much profit as has come in the past to the lumber and livestock industries. Furthermore, there would be the immense social value of having the Indians working for their income.

The Wheeler-Howard Act, authorizing the appropriation of \$10,000,000 for loans to Indian tribes, communities, or individuals, should help to make possible the use of the Indian resources by the Indians themselves. Through capital borrowed from the Government the Indians on most of the reservations should be able to purchase either their own sawmills and logging equipment or a foundation livestock herd with which to utilize their forest and range.

DECENTRALIZATION NEEDED

It seems very important to the satisfactory administration of the Forestry Division that many of the decisions now made in Washington affecting land and individuals 3,000 miles away should hereafter be made in the field, either on the reservations or in the district offices. In order to bring about this decentralization it will be necessary to rewrite our forestry and grazing regulations.

ROADS

On August 14, \$4,000,000 of Public Works funds were allotted to the Indian Service for road construction. The following figures indicate the results obtained by April 1, 1934:

1,450 miles of new road constructed.	1,957 culverts constructed.
2,941 miles of old road improved.	11,804 Indians employed.
330 miles of road graveled.	505 Indians in skilled positions.
345 bridges constructed.	445 white men in skilled positions.
146 old bridges repaired.	

We feel that this is a creditable showing. Statistics as of June 30 are not available from the 70 Indian agencies where roads were constructed; it is estimated, however, that the figures for new roads, bridges, etc., will be increased approximately 25 percent.

It is the policy of the Indian Service to construct secondary roads to serve the needs of the Indians and for the administration of their property. Careful consideration is given to secure the best location of each road, to secure good alignment and easy grades so that no money will have been wasted should it ever be decided to improve these roads to a higher standard in the future. Everywhere the overhead costs have been kept to the minimum. Fully 75 percent of the money expended has gone into the Indian laborers' pockets. The balance has gone for machinery, bridge timbers, engineering, etc. Very little road work has been done by contract. It has been found that more Indian employment was possible and better general results obtained through supervision by the Indian Service of its own road work under force account.

Close cooperation is maintained with the county and State highway officials as well as with the Bureau of Public Roads of the Department of Agriculture on all roads on or near Indian reservations in which there is mutual interest. Where local counties are financially unable to improve county roads that cross Indian lands and which serve the Indians, the Indian Service cooperates in improving such roads by furnishing Indian labor and the counties the necessary machinery, engineering, and supervision.

The allotment of \$4,000,000 of Public Works funds has served two worthy purposes: The provision of much needed improved roads; and employment for destitute Indians. Road work can be done in every community of every reservation, and at a time of the year when the Indians are not busy with their crops or doing other work.

The Indians are enthusiastic about their road programs and are learning rapidly to assume responsible positions that heretofore have been filled only by whites. The figures above tabulated indicate how rapidly they are filling the skilled positions. Road construction offers a good opportunity to train them to repair and handle all kinds of

machinery and to assume the entire supervision of road construction and road improvements on their reservations.

IRRIGATION

During the year the Secretary of the Interior approved the reorganization of the administrative set-up of Indian irrigation projects; the consolidation of the irrigation personnel of the various projects with the regular agency personnel; and the turning over of responsibility for purely Indian projects to the local superintendents as soon as plans therefor could be perfected. Major projects, especially those containing considerable portions of non-Indian lands, will continue directly under the supervision of the irrigation division, at least until completion of the construction program. This will not only vest local administrative supervision and responsibility with the head of each unit, but will also result in a better correlated unit-program. The supervising engineers will thus be relieved of a large portion of administrative duties, permitting a greater portion of time to be spent on technical duties and advisory work.

PUBLIC WORKS PROJECTS

Shortly after the beginning of the year the Public Works Administration allotted \$6,164,050 for construction work on irrigation projects on the various Indian reservations throughout the arid and semiarid Western States. Subsequent allotments totaling \$789,000 were received for additional work necessitated by flood and storm damages and for the carrying out of an urgently needed well program on the San Carlos project, Arizona. These funds, totaling in all \$6,953,050, are to be expended in the development, storage, and distribution of water to the irrigable lands on the several reservations. Through the end of the fiscal year an actual total of 318,801 man-days of work had been done, of which approximately 56 percent, or 177,680, was by Indians.

In the Southwest area \$1,274,050 was allotted principally for the development of new projects and in part for the rehabilitation or enlargement of existing projects, involving the construction of numerous small storage and diversion structures and many miles of main canals and lateral distributary systems. In addition to this, protection from flash floods typical in the southwestern part of the country has been provided either directly from special structures or indirectly from irrigation construction operations. The new projects in this area, either completed or soon to be completed, consist principally of relatively small developments, ranging in size from a few acres to several hundred acres, constructed for subsistence farming by the Indians. In addition to direct irrigation and flood control work in the South-

west, the irrigation division was busy with the location and development of water for domestic and stock consumption as well as for use at the many day schools being constructed in that area.

In the northern and northwestern States, the available Public Works funds were used for the completion *in toto* or in part of the major Indian irrigation projects and the rehabilitation of such projects for more efficient and economical operation.

Water supply work on the Flathead project, Montana, is being completed with the receipt of Public Works funds.

DROUGHT MEASURES

On several of the projects it was necessary to prorate the available water on a greatly curtailed per-acre basis, due to the widespread water shortage. A rotation system of distribution of such water was adopted where feasible and every effort made to conserve the reduced supply. In a great many instances it was necessary to waive existing regulations prohibiting delivery of water until current and all past due charges had been paid, by permitting delivery of water upon payment of current charges and execution of promissory notes adequately secured by chattel mortgages for the unpaid balance from previous years. This action afforded temporary relief which cannot be made permanent until and unless general economic conditions continue to improve.

ROUTINE OPERATIONS

During the year numerous engineering investigations were made in connection with the proposed construction work. Routine operation and maintenance work was carried on at the various projects, consisting of canal and lateral rehabilitation, enlargement and extension, structure replacement and water distribution. Legal activities consisted of the study of various water rights, proposed and pending litigation, and the drafting and review of numerous contracts covering the division's activities. Favorable progress was made toward the final settlement of the so-called "Gila River Adjudication Suit" by way of consent decree. The proposed decree, approved both by the Secretary of the Interior and the Attorney General as drafted, while not entirely satisfactory, represents the most in the way of water-right recognition and safeguards that could be secured in the circumstances. Supplemental repayment contracts were entered into between the Government and both the Flathead and the Mission irrigation districts, Flathead Reservation, Mont. A decision favorable to the United States was rendered by the Circuit Court of Appeals, Ninth Circuit, in the "Moody litigation" when it directed the local district court to dismiss the cases for lack of necessary parties.

Operations by the Middle Rio Grande conservancy district under its contract for irrigation and flood protection work benefiting several of the New Mexico pueblos, progressed very satisfactorily with the completion of numerous features of its approved plan. On several of the benefited pueblos subjugation by the Indians of newly reclaimed areas was successfully undertaken, with the Indians actively interested in the work.

EXTENSION AND INDUSTRY

This division is working toward better living conditions among Indians, principally by encouraging them to help themselves. The reservation extension programs are worked out in cooperation with the Indians, and the work is steadily becoming better organized and its purposes better understood by the Indians.

The agricultural statistics given herewith are for the calendar year 1933.

INDIAN ORGANIZATIONS

There are 604 Indian organizations through which extension programs are promoted, with an active membership of 16,631 men and 9,734 women; a total of 1,228 Indian men and 1,330 women assisted with our various local programs.

Chapter houses, which serve as local community centers, are built as meeting places for these organizations. There are now 131 such houses, 26 having been built during the past year. The Extension Division is making increased use of Indian leadership in forwarding its program.

AGRICULTURE

The agricultural program of the Extension Division is planned to help the Indians to provide more food for themselves, and a more nearly adequate supply of feed for their livestock. Commercial farming for cash-crop production is not neglected, but its importance is secondary.

As in 1932, garden and crop acreages showed satisfactory increases in 1933. Harvests, however, were meager. The full force of the 1933 drought was felt on the Oklahoma, Dakota, and Montana reservations, and it was severe on many others.

A 3-year comparison of garden work on 44 jurisdictions shows the following results:

Year	Acreage	Number of families growing gardens	Size (acres)
1931.....	13, 250	15, 251	0. 868
1932.....	19, 869	18, 358	1. 072
1933.....	21, 231	21, 309	. 996

Indians on 73 reservations operated 30,278 farms in 1933, totaling 604,346 acres. These figures, plus the fact that 58 percent of all families were engaged in farming activities, indicate the realization by the Indians of the necessity of producing a large part of their living from the land. Cooperation was given the Agricultural Adjustment Administration in reducing acreages of certain crops.

LIVESTOCK

Extension activities in livestock included 1,577 demonstrations and 492 demonstration meetings, at which 8,210 Indians were in attendance. A total of 2,014 improved sires were purchased.

Sheep are definitely linked with the welfare of large numbers of Indian people, especially those living in the Southwest. Improvement in sheep and wool is receiving attention, but the overgrazed condition of the range in this section precludes as much improvement as should be made until a program of livestock reduction is put into force. Approximately 86,000 sheep were sold to the Federal Surplus Relief Corporation during the year, relieving conditions considerably.

The numbers of Indian-owned swine have increased to 17,328.

Poultry keeping among Indian people is a comparatively new business. Turkey raising assumes commercial importance on some reservations, \$21,354 worth having been sold in 1933. A total of 602 poultry demonstrations were given.

4-H CLUB WORK

A total of 319 organized clubs carried projects with a membership of 1,409 boys and 1,915 girls, of whom 2,398 members completed their work, or 72 percent of those enrolled—an outstanding percentage.

HOME EXTENSION WORK

Indian women are working conspicuously well with our extension staff. Tangible results of their cooperation are shown in the following figures:

In 1933, 3,855 families adopted improved nutrition practices, as against approximately 100 in 1931. As a result of canning and drying demonstrations, 775,318 pounds of fruit, vegetables, and meats were dried, and 532,396 quarts canned. Under Extension Division auspices 42,199 pieces of clothing were made. Four special projects—home-made furniture, home care, home yard care, and the improvement of bedding—were carried on our program in cooperation with the General Federation of Women's Clubs.

FARM AND HOME BUILDING

A special survey of the condition of Indian homes showed the following results:

Type of dwelling	Condition			
	Good	Fair	Poor	Total
Houses.....	8,952	12,065	10,633	31,650
Hogans.....	2,816	4,207	3,830	10,853
Tipis, tents, etc.....	310	360	176	846
Total.....	12,078	16,632	14,639	43,349

A total of 1,062 new dwellings were constructed at an estimated cost of \$388,040; and 1,244 remodeled, with a resulting increased value of \$147,961. Barns and outbuildings of various kinds were also built and remodeled.

GENERAL EXTENSION WORK

The following figures summarize general extension work:

Extension workers made 152,825 farm and home visits during the year. A total of 337,982 office calls and 67,943 telephone calls were received. Workers wrote 78,918 individual letters, prepared 1,063 circulars, of which 73,205 copies were sent out, and distributed 26,736 bulletins. Exhibits were shown at 384 events; 246 training meetings were held for local leaders, at which 4,499 were in attendance; 5,163 demonstration meetings were held, with an attendance of 83,457; 168 tours conducted, with an attendance of 2,653; 182 achievement days held, with an attendance of 24,705; and 3,000 other extension meetings arranged, with an attendance of 137,127. There were 1,332 meetings held by local leaders, with an attendance of 19,675. All meetings held during the year totaled 11,128, with an attendance of 309,510.

AGRICULTURAL LEASING

Leasing of Indian farm lands decreased during the year, due to continued low prices of farm products, to drought and grasshopper scourges, and to the efforts of extension workers to convince the Indians that they must use more of their lands themselves in order to become self-supporting. The number of leases decreased from 26,522 in 1932 to 21,452 in 1933, with a reduction in acreage from 2,684,790 to 2,499,422.

REIMBURSABLE FUNDS

The amount actually made available under "Industry among Indians, 1934" was \$299,200, of which \$40,000 was used for the Pima land subjugation work, leaving \$259,200 for general industrial purposes. Allotments of various tribal revolving funds aggregating \$161,058.23 were used to supplement this fund, bringing the total to \$420,258.23.

The greater proportion of these funds, \$372,064.69, was used for industrial loans. Other loans totaling \$18,406.45 were made for educational purposes, and subsistence was provided for 203 individual Indians through loans totaling \$29,787.09.

COMING DEMANDS

The new land-use program will throw great burdens on our Extension Service and call sharply for its rapid enlargement and enrichment. We must assume that land will not be purchased for Indians to lease to whites; every acre bought must be used by Indians. The purchase program will therefore give extension an important new job in developing these lands for Indian use.

The Indian credit system, to be effective, will demand careful supervision and the making of detailed farm management plans, the organization of Indian stock associations, and the development of many economic enterprises, together with housing projects and the purchase of livestock, farm equipment, seed, and many other things. Here again, extension, including home development, will play a vital role.

INDIAN EMPLOYMENT

PRESENT INDIAN SERVICE EMPLOYMENT OF INDIANS

The drive for employment of Indians in the Indian Service has gone vigorously ahead this year. There are 5,325 persons, Indians and whites, holding regular classified positions in the Indian Service, exclusive of Alaska. Of these, 1,785 are Indians, 489 of whom were appointed this fiscal year. Indians employed in all branches of work—regular, irregular labor, and emergency—numbered 20,017 on June 30, 1934.

OPPORTUNITIES FOR INDIANS

While the greater number of the Indians continue to fill minor positions, Indians are also found in the whole range of positions in the Service, excepting only those of doctors and engineers. The larger groups in the regular positions are found among teachers and clerks.

By Presidential order this year all Indian Service positions under Civil Service are open to Indians by noncompetitive examination. The Civil Service Commission has likewise approved a maximum salary of \$1,200 a year instead of the former \$720 for the Indian assistant position, and permits employment as Indian assistant to count for experience in classified positions. This latter step provides a means for Indians otherwise qualified and lacking only experience to qualify under schedule B for regular Civil Service positions as vacancies occur. In the Washington office the Indian Employment Division is building up a file of Indians' applications to be drawn

upon in carrying out that provision of the Wheeler-Howard Act which requires that Indians be given first consideration in the filling of vacancies. Definite plans are under way for extended in-service training, as well as for educational opportunities through scholarship loans, so that Indians may fill the more responsible positions of the Service.

WORK OF THE INDIAN EMPLOYMENT DIVISION

During the fiscal year ending June 30, 1934, the Indian Employment Division has been instrumental in placing directly, or in cooperation with the National Reemployment Service and various State employment services, 5,906 Indians in positions outside the Indian Service. This exceeded the corresponding number for the previous fiscal year by 2,682. A large proportion of these were in connection with various emergency projects financed by the Federal Government.

Much of the time of our employment agents in the field has been devoted to recruiting competent Indians for the Indian Service, particularly for Emergency Conservation Work and Public Works. After investigation of their qualifications, 3,584 Indians were placed in skilled and semiskilled work. Of these, 2,194 were placed on Emergency Conservation Work; 118 on Public Works—construction; 678 on Public Works—roads; 189 on Public Works—irrigation; 330 on Civil Works; and 75 in regular Indian Service positions.

The Emergency Conservation Work and Public Works activities have given opportunity for many Indians to win promotion from the ranks to positions of varying degrees of administrative responsibility. One thousand four hundred and one Indians hold positions in Emergency Conservation Work and Public Works of the foremen level or above and in clerical positions. All but 10 of these appointments were made this year.

APPROPRIATIONS

ANNUAL APPROPRIATIONS

The annual recurring expenses of the Indian Service have been further reduced. Congress appropriated \$18,996,545.67 from the Federal Treasury, but expenditures therefrom were limited to \$16,586,059. Continuing the retrenchment policy, additional reductions have been made for the coming year 1935, for which Congress provided \$16,275,185. This amount includes some increase in the amount charged to the Federal Treasury for expenses heretofore borne by Indian tribal funds. It also includes restoration of 5 percent of the pay cut applied to Federal employees. The reduction is in fact greater than shown by the foregoing figures. There follows a comparative statement showing appropriations for the Service for the last 4 years.

	1932	1933	1934	1935
General purposes.....	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00	\$1,325,015
Industrial assistance.....	1,605,000.00	1,301,000.00	1,233,881.67	1,060,510
Irrigation and water development.....	497,601.00	457,824.00	599,614.00	450,665
Education.....	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565
Conservation of health.....	3,658,000.00	3,508,800.00	3,281,800.00	3,264,595
Support of Indians.....	2,216,300.00	2,156,300.00	2,141,900.00	2,141,815
Miscellaneous (roads, annuities, etc.).....	40,020.00	31,020.00	31,020.00	42,020
Subtotal.....	20,789,606.73	19,065,998.35	17,984,945.67	16,275,185
Construction.....	5,570,440.00	1,654,100.00	711,600.00	-----
Roads.....	670,000.00	1,420,000.00	270,000.00	-----
Total.....	27,030,046.73	22,140,098.35	18,966,545.67	16,275,185

Specific appropriations from tribal funds were made to supplement the foregoing Treasury appropriations as noted in the following tabulations:

	1932	1933	1934	1935
General purposes.....	\$332,913.98	\$126,300	\$390,501	\$100,000
Industrial assistance.....	180,532.21	45,000	188,000	35,000
Irrigation and water development.....	49,500.00	59,000	46,950	6,720
Education.....	910,000.00	803,000	708,600	599,550
Conservation of health.....	125,000.00	125,000	131,550	121,490
Support of Indians.....	1,767,100.00	1,032,380	789,100	564,155
Miscellaneous (roads, annuities, etc.).....	50,000.00	25,000	25,000	-----
Total.....	3,415,046.19	2,215,680	2,279,701	1,426,915

Certain sums are also authorized for expenditure under so-called "permanent and indefinite appropriations." For 1934 these aggregated \$5,890,600. This was reduced to \$4,876,000 for 1935 and included \$311,500 representing construction, operation, and maintenance collections expended on Indian irrigation projects. This money has not heretofore been definitely accounted for either in the budget or annual appropriation act. The appropriations for 1934 from all funds aggregated \$24,857,145.67. For 1935 this sum is reduced by \$3,705,960.67, making the total sum available for expenditure only \$21,151,185. This amount does not include allotments from special funds for Indian Emergency Conservation, Public Works, and other activities in the Indian Service associated with the National Industrial Recovery program.

REDUCTION IN PERSONNEL

Employees in the Washington office in 1932 totaled 210; in 1934 this number was reduced to 175. Expenditures involved were \$493,647 and \$345,568, respectively. A part of this reduction is accounted for by the transfer of 22 positions with salaries aggregating \$53,780 to the purchasing office of the Interior Department. There was a net reduction of 23 employees at the Washington office.

In the entire service during 1932 there were 6,638 regular employees. The total required for salaries was \$10,627,724. On July 1, 1934 this

number had been reduced to 5,653. A comparison of the gross amount for salaries is omitted because of the pay reductions in effect during the last year.

The foregoing comparisons do not take into account the activities financed from emergency funds such as emergency conservation and public works.

PUBLIC WORKS

During the year a total of \$19,034,550 was allotted from the public works appropriation for Indian Service projects. This may be divided into headings approximately as follows:

Day schools.....	\$3, 613, 000
Hospitals.....	1, 815, 500
Roads and bridges.....	4, 028, 500
Irrigation and drainage.....	5, 953, 050
Subjugation of raw lands (Pima).....	1, 000, 000
Quarters for personnel.....	433, 000
Land utilization institute, Navajo.....	950, 000
Water and sewer systems.....	301, 500
Heating and power plants.....	295, 000
Alaska, small items.....	100, 000
Miscellaneous structure.....	545, 000
<hr/>	
Total public works.....	19, 034, 550

The major undertakings under the public works program are discussed elsewhere in this report under the functional activities involved.

ALTERNATE BUDGET

The act of March 2, 1933 directed the submission of an alternate arrangement of Indian Office estimates for the fiscal year 1935. Such an arrangement was prepared and submitted but was not adopted by Congress. We have tried to obtain legislation requiring the submission of a new simplified budget, set up on geographic and functional lines, in place of the present unsatisfactory budget; but so far without success. It is hoped that intelligent Indian Service budgets can eventually be formulated. The provisions of the Wheeler-Howard Act will eventually force the change, inasmuch as we will be required to submit estimates to local Indian groups in advance of transmission of estimates to the Budget Bureau and to Congress.

CONSTRUCTION

A total of \$981,600 was provided from regular appropriation for construction purposes during this year. Practically all of this amount was withdrawn from expenditure to be replaced later by allotments from the public works appropriation. The amount normally available for annual expenditure for construction during the year was

increased many times through the public works allotments. The Bureau has not been able to prepare plans and specifications for projects in advance of the availability of funds. Consequently, when money was provided for day schools, hospitals, heating, water, sewer, and power systems, and miscellaneous buildings, the small technical staff was insufficient in size to design structures and draft specifications so that construction could be speedily undertaken. A contract was therefore negotiated with a firm of New York architects for preparing plans and specifications for practically all the projects in the Southwest and a number of other projects located in other parts of the Indian country. Later, when funds became available for new hospital construction, a contract was negotiated with a firm of Chicago architects having broad experience in designing hospitals. The plans drafted by these firms of private architects have taken into account the use of native material, where possible, and employment of local Indians. The design of buildings in the Southwest is simple and distinctly Indian. Use of native material in the erection of buildings will not only bring work opportunities to local Indians but will provide an incentive for individuals and groups to better their own types of construction.

As an aid in expediting the public works program, a field construction office was established in Albuquerque, N.Mex. This office is staffed with an adequate number of clerical and technical employees and necessary supervisory personnel has been appointed to oversee actual construction. Local superintendents in this area have been relieved of construction responsibilities and the disbursement of funds connected therewith. A similar central office smaller in size has been established at Billings, Mont. Here the construction employees will handle the technical details including supervision of construction, and advertising for material and supplies, but the local superintendents will disburse the funds. A third office is located at Muskogee, Okla., but because of the small volume of business it has not been found necessary to greatly increase the personnel for construction in this territory.

At the close of the fiscal year, projects aggregating ultimate expenditures of approximately \$14,000,000 were under way and a number had been completed. With few exceptions, it is anticipated that by June 30, 1935, all projects will be completed.

RECENT DEVELOPMENTS

Reorganization of Indian Service.—Various administrative readjustments, set in motion during the year, and looking toward administrative decentralization, with regional and reservation planning, were brought together in circular 3011, dated July 14, 1934.

Navajo reorganization.—Radical reorganizations of Navajo administration were set under way during the year. One central headquarters will replace 6, and the services and human contacts will be decentralized into more than 20 local headquarters, which usually will be placed in the new day schools. Each local area will be a project area, resting upon a local organization of the Indians. The Indian Service in all its branches, and the Soil Erosion Service, will clear their local contacts in each area through the local subagent, who will be the school principal, or stockman, or soil engineer, or public health nurse, as the case may be. Interferences from Washington will be diminished. And in the local areas, if present purposes can be carried out, the mass of the Indians will be reached through their Navajo language, as well as through English.

As part of the new Navajo program, a study of the methods of trading on the reservation and of the Navajo economic situation in its totality is being made by Dr. B. Youngblood, loaned to the Soil Erosion Service and the Indian Service by the Department of Agriculture.

The largest soil-erosion area, among the numerous areas in different parts of the country which are being dealt with by the Soil Erosion Service of the Department of the Interior, is the combined Navajo and Zuni area. Unity of effort between the Soil Erosion Service and the Indian Service, through this largest segment of the Indian country, is complete.

Indian arts and crafts.—A committee, appointed by the Secretary of the Interior and headed by Prof. James W. Young of the University of Chicago, is making a study of Indian arts and crafts, with a view to determining how these Indian assets may be protected, brought into a larger and better market, and made permanent in the life both of the Indians and of the Nation.

Civil works of art.—Under the Civil Works Administration, beautiful murals and other painting and craft works were carried out by the Indians.

Affiliations with anthropology.—An anthropological consultant group, advisory to the Secretary of the Interior, was formed during the year. Dr. Duncan Strong, of the Smithsonian Institution, was designated liaison officer between that Institution and the Indian Service.

Training for careers in the Indian Service.—Negotiations were opened with a number of the universities, looking to the establishment of courses to prepare for careers in the Indian Service. In addition, plans, which will mature during the year ahead, were made for the in-service training of employed workers.

Cooperation of Indian welfare organizations.—Throughout the year, generous cooperation and needed criticism were received from the General Federation of Women's Clubs, the American Indian Defense Association, Inc., the National Association on Indian Affairs, Inc., the Indian Rights Association, and some other groups. The Indian Service, for its continuing improvement, is greatly dependent on such help and criticism from unofficial and wholly independent agencies.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among the absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

The tabulation of each census roll by reservation was made in the field by the various agencies and assembled as a whole in the Indian Office.

The total of estimated and enumerated number of Indians thus reported in 1934 was 327,958. This number consists of 234,792 Indians actually enumerated and 93,166 Indians taken from earlier or special censuses and estimates based on records. For convenience, the latter number will be considered hereafter as an estimate. (See tabular statement below.)

The Bureau of the Census reported 72,626 Indians of the Five Civilized Tribes in 1930, and this number has been substituted for our previous estimated population of the Five Civilized Tribes. The population by tribe is as follows: Cherokee, 40,904; Chickasaw, 4,685; Choctaw, 16,641; Creek, 8,607; and Seminole, 1,789. (See page 40 of the Annual Report of the Commissioner of Indian Affairs, June 30, 1931, for further discussion on the estimated population for Five Civilized Tribes.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on April 1, 1934 represents an increase over the

corresponding figure for the previous year of 7,504, or 2.3 percent. Over one-half of this increase is accounted for by the addition of 4,483 Indians in California. (See statement, p. 123.)

Of the 234,792 Indians enumerated, 119,724 were males; 115,068, females.

It is significant, when the Indians enumerated are considered, that 200,744, or 85.5 percent, resided at Federal jurisdiction where enrolled, while only 5,015, or 2.1 percent, resided at another jurisdiction, and 29,033, or 12.4 percent resided elsewhere; that is, outside of any Federal jurisdiction.

Of the 32,447 Indians residing elsewhere on April 1, 1930, 41 were living in the New England States, 208 in the Middle Atlantic, 3,633 in the East North Central, 9,234 in the West North Central, 437 in the South Atlantic, 93 in the East South Central, 2,166 in the West South Central, 5,120 in the Mountain States, and 6,024 in the Pacific States, and for 5,491 Indians the residence was either not reported or unknown.

The Indian population is nearly all in 22 States. The combined population of 4 States, Oklahoma, Arizona, New Mexico, and South Dakota, is 200,494, or 61.1 percent of the total Indian population; while 290,547, or 88.6 percent, are in 10 States (including the 4 above States), leaving only 37,411 Indians in the other 39 States, including the District of Columbia.

Oklahoma has far more Indians than any other State. If the Federal Census population of the Five Civilized Tribes is included, the Indian population is 94,980, or 29 percent of the aggregate Indian population. Arizona ranks next with 44,093, or 13.4 percent, followed by New Mexico with 34,726, or 10.6 percent, and South Dakota, 26,695, or 8.1 percent of the total. The other 6 Indian States are: California, 23,808; Montana, 15,255; Minnesota, 15,200; Washington, 13,418; Wisconsin, 12,085; North Dakota, 10,287.

According to a tabulation of the tribes enumerated on April 1, 1930, the most important numerically were the Navajo, Sioux, including Assiniboin, and Chippewa, numbering 40,862, 33,168, and 23,647, respectively.

Heretofore the entire population of Western Navajo Reservation was reported under Arizona. This year, the population of the reservation extending over into Utah is included under that State; hence the seeming decrease in the population of Western Navajo Reservation in Arizona.

Unusual changes in the population of other agencies are also shown, and this is caused by the transfer of reservations from one jurisdiction to another. Such changes are shown in table 2 by footnote.

The Indian population not actually enumerated (termed an estimate) is 93,166 which is compiled as follows:

California, Sacramento Agency, part of 1930 estimate.....	8, 761
California, Indian Census, May 16, 1933, not otherwise reported.....	4, 483
Michigan, 1927 census.....	1, 192
New York, 1932 estimate.....	4, 523
Oklahoma, Five Civilized Tribes, Bureau of the Census, 1930:	
Cherokee.....	40, 904
Chickasaw.....	4, 685
Choctaw.....	16, 641
Creek.....	8, 607
Seminole.....	1, 789
	72, 626
Texas, 1931 special report.....	250
Washington, Taholah Agency, scattered bands, 1932 estimate ¹	511
Wisconsin:	
Rice Lake band of Chippewas, special census, July 1930.....	221
Stockbridge Reservation, Keshena Agency, 1910 census.....	599

The following Indian statistics are from bulletins issued by the Bureau of the Census, Department of Commerce, 1930, and are for Indians in continental United States.

According to the Bureau of the Census, 299,581 Indians, or 90.1 percent of the entire Indian population, reside in rural communities, while the number living in urban communities was only 32,816.

The Indians 5 to 20 years of age attending school in the United States in 1930 numbered 77,806, or 60.2 percent. The corresponding proportions for 1920, 1910, and 1900 are 53.8, 50.8, and 40.4, respectively, which show a constant climb in the number of Indian children in school.

The illiterate Indians 10 years of age and over in 1930 numbered 61,517, or 25.7 percent. This is an enormous drop from 56.2 percent in 1900, 45.3 percent in 1910, and 34.9 percent in 1920. Each decade has shown a considerable decrease in the Indian illiteracy.

The Indian population in the 25 States in which there were no Federal agencies in 1930 was 10,456. Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2. See the 1933 Annual Report of the Secretary of the Interior, page 112, table 1.

Table 1.—Indian Population by Age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All ages.....	332, 397	170, 350	162, 047	25 to 29 years.....	23, 491	12, 127	11, 364
Under 5 years.....	46, 680	23, 447	23, 233	30 to 34 years.....	19, 309	10, 032	9, 277
Under 1 year.....	9, 296	4, 681	4, 615	35 to 44 years.....	33, 031	17, 285	15, 746
5 to 9 years.....	46, 736	23, 434	23, 302	45 to 54 years.....	25, 039	13, 403	11, 636
10 to 14 years.....	39, 456	20, 028	19, 428	55 to 64 years.....	16, 787	9, 178	7, 609
15 to 19 years.....	36, 219	18, 154	18, 065	65 to 74 years.....	10, 030	5, 257	4, 773
20 to 24 years.....	28, 843	14, 697	14, 146	75 and over.....	6, 327	3, 079	3, 248
				Unknown.....	449	229	220

Source: Bureau of the Census, Department of Commerce.

¹ During 1933, 150 Indians of the scattered bands were allotted on the Quinaielt Reservation and included in the enumerated population, table 2.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Total enumerated Indian population¹	234,792	119,724	115,068	200,744	103,037	97,707	5,015	2,464	2,551	29,033	14,223	14,810
Arizona²	44,093	22,772	21,321	42,744	22,072	20,672	197	89	108	1,452	611	541
Colorado River Agency	1,137	625	512	934	344	283	28	19	9	482	262	220
Colorado River Reservation	705	350	355	559	300	259	22	16	6	124	64	60
Chemehuevi	279	137	142	181	89	92	1		1	97	48	49
Chemehuevi-Chippewa	1			1	1							
Chemehuevi-Paiute	3	2	1							3	2	1
Chemehuevi-Papago	1	1								1	1	
Cocopah	4	1	3				1		1	3	1	
Mission	1											
Mojave	359	198	161	334	182	152	10	8	2	15	8	7
Mojave-Chemehuevi	22	16	6	18	13	5				4	3	1
Mojave-Cocopah	4	2	2	4	2	2						
Mojave-Hopi	1	1		1	1							
Mojave-Papago	8	4	4	8	4	4						
Mojave-Pawnee	1	1		1	1							
Mojave-Pima	2	1	1	2	1	1						
Mojave-Pueblo	1			1	1					1	1	
Mojave-Yuma	16	12	4	7	5	2	9	7	2			
Paiute	1	1								1	1	
Yuma	1	1					1	1				
Fort Mojave Reservation	432	245	187	68	44	24	6	3	3	358	198	160
Chemehuevi	3	1	2							3	1	2
Maidu	1									1		
Mojave	410	237	173	67	43	24	3	3		340	191	149
Mojave-Maidu	1	1								1	1	
Mojave-Mission	4	2	2							4	2	2
Mojave-Paiute	3		3							3		3
Mojave-Pima	5	2	3							5	2	3
Mojave-Yuma	5	2	3	1	1		3		3	1	1	
Fort Apache Agency and Reservation (Apache)	2,718	1,424	1,294	2,671	1,402	1,269	9	5	4	38	17	21
Fort Yuma Agency, in California, and Cocopah Reservation (Cocopah)	32	20	12	32	20	12						
Hopi Agency and Reservation	6,095	3,173	2,922	5,997	3,126	2,871	10	7	3	88	40	48
Hopi	2,538	1,318	1,220	2,457	1,280	1,177	6	4	2	75	34	41
Hopi-Blackfeet	2	2					2	2				
Hopi-Cherokee	1			1								
Hopi-Klamath	2	1	1	2	1	1						
Hopi-Navajo	13	4	9	13	4	9						
Hopi-Papago	2	1	1	2	1	1						

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arizona—Continued.												
Pima Agency—Continued.												
Salt River Reservation ³	1,049	536	513	951	493	458	59	20	39	39	23	16
Apache.....	2	2	2	2	2	2						
Maricopa.....	2	2	1	1		1						
Papago.....	1											
Pima.....	1,043	534	509	945	491	454	59	20	39	39	23	16
Pueblo.....	1		1	1		1						
San Carlos Agency and Reservation (Apache)												
Sells Agency ⁴	2,843	1,455	1,388	2,831	1,447	1,384	3	2	1	9	6	3
Gila Bend Reservation ⁴	5,899	3,016	2,883	5,869	3,010	2,879	10	6	4			
Papago Reservation ⁵	228	125	103	228	125	103						
Papago.....	5,146	2,616	2,530	5,136	2,610	2,526	10	6	4			
Papago.....	5,136	2,610	2,526	5,136	2,610	2,526						
Pima.....	10	6	4				10	6	4			
Pima.....	525	275	250	525	275	250						
San Xavier Reservation (Papago)												
Southern Navajo Agency and Navajo Reservation, see New Mexico (Navajo)	11,546	5,965	5,581	11,536	5,962	5,574	6	3	3	4		4
Truxton Canon Agency ⁷	652	344	308	652	344	308	9	6	3	262	136	126
Havasupai Reservation ⁷	201	111	90	199	109	87	1	1		1	1	
Havasupai.....	192	105	87	190	103	87						
Havasupai.....	9	6	3	9	6	3						
Hualapai Reservation	451	233	218	452	233	219	8	5	3	261	135	126
Walapai.....	440	224	216	440	224	216	7	5	2	256	130	126
Walapai-Cherokee.....	1	1		1						1	1	
Walapai-Havasupai.....	7	6	1	5	4	1				2	2	
Walapai-Hoopa.....	3	2	1				1		1	2	2	
Western Navajo Agency, and Navajo Reservation, see Utah²												
Hopi.....	4,572	2,310	2,262	4,544	2,299	2,245	20	8	12	8	3	5
Hopi.....	418	219	199	418	219	186	16	6	10	4	1	3
Navajo.....	4,122	2,072	2,050	4,118	2,070	2,048				4	2	2
Paute.....	32	19	13	28	17	11	4	2	2			
Paute.....	10,564	5,414	5,150	8,939	4,636	4,303	35	20	15	1,590	758	832
California												
Fort Yuma Agency, see Arizona, and Fort Yuma Reservation (Yuma)												
Hoopa Valley Agency	819	422	397	748	385	363	4	2	2	67	35	32
Hoopa Valley Reservation	1,953	963	990	1,506	755	751	4	4	5	234	204	234
Hoopa Valley Agency	1,542	755	787	1,274	631	643	9	4	6	259	120	139
Hoopa.....	554	287	267	494	258	236	9	4	5	51	25	26
Hoopa-Klamath.....	3	2	1	3		1						
Klamath.....	985	466	519	777	371	406				208	96	113

	411	208	203	232	124	108	179	84	95
Rancheria -----	23	13	10	19	11	8	---	---	---
Bear River (Bear River)-----	69	36	33	44	19	25	---	---	2
Blue Lake (Blue Lake)-----	48	19	29	---	---	---	---	---	4
Crescent City (Smith River)-----	154	79	75	85	48	37	---	---	17
Eel River (Miami)-----	117	61	56	---	46	38	---	---	19
Smith River (Smith River)-----	2,897	1,537	1,360	2,073	1,145	928	---	---	38
Mission Agency -----	14	8	6	13	7	6	---	---	15
Augustine Reservation (Mission)-----	29	18	11	24	13	11	---	---	390
Cabezon Reservation (Mission)-----	107	55	52	65	34	31	---	---	428
Cahuilla Reservation (Mission)-----	135	70	65	117	59	58	---	---	---
Campo Grande Reservation (Mission)-----	160	82	78	141	78	63	---	---	21
Capitan Grande Reservation (Mission)-----	5	1	4	3	---	---	---	---	7
Cuyapaipe Reservation (Mission)-----	33	16	17	30	13	17	---	---	15
Inala Reservation (Mission)-----	3	2	1	3	2	1	---	---	1
Laguna Reservation (Mission)-----	221	120	101	144	83	61	---	---	3
LaJolla Reservation (Mission)-----	88	51	2	72	46	26	---	---	40
Los Coyotes Reservation (Mission)-----	67	30	37	58	29	29	---	---	37
Manzanita Reservation (Mission)-----	218	122	96	149	88	61	---	---	1
Mesa Grande Reservation (Mission)-----	20	10	13	10	7	6	---	---	8
Mission Creek Reservation (Mission)-----	292	155	137	191	112	79	---	---	33
Morongo Reservation (Mission)-----	205	108	97	151	84	67	---	---	4
Pala Reservation (Mission)-----	50	25	25	49	25	24	---	---	101
Palm Springs Reservation (Mission)-----	69	37	32	47	27	20	---	---	43
Pauma Reservation (Mission)-----	216	108	101	101	55	46	---	---	58
Rechanja Reservation (Mission)-----	181	98	83	111	60	51	---	---	1
Rincon Reservation (Mission)-----	40	22	18	26	15	11	---	---	12
San Manuel Reservation (Mission)-----	9	4	5	9	4	5	---	---	62
San Pascual Reservation (Mission)-----	50	31	19	23	13	10	---	---	32
Santa Rosa Reservation (Mission)-----	90	43	47	19	11	8	---	---	7
Santa Ynez Reservation (Mission)-----	237	127	110	192	106	86	---	---	27
Santa Ysabel Reservation (Mission)-----	122	61	61	106	52	54	---	---	32
Sycuan Reservation (Mission)-----	35	16	19	35	18	19	---	---	21
Torres-Martinez Reservation (Mission)-----	188	116	82	179	105	74	---	---	9
Sacramento Agency-----	3,317	1,703	1,614	3,121	1,597	1,534	---	---	39
Fort Bidwell Reservation-----	136	81	55	98	55	43	---	---	23
Mojave-----	---	---	---	---	---	---	---	---	7
Paite-----	128	79	49	95	54	41	---	---	18
Paite-Mojave-----	8	1	2	---	---	---	---	---	11
Paute-Wasco-----	3	1	2	3	1	2	---	---	98
Snohomish-----	1	---	1	---	---	---	---	---	19
Fort Bidwell Reserve and Public Domain -----	---	---	---	---	---	---	---	---	1
Alloiments -----	433	209	224	337	162	175	---	---	96
Maidu-----	1	1	---	---	---	---	---	---	47
Paute-----	109	53	56	19	8	11	---	---	45
Pit River-----	307	148	159	301	146	155	---	---	2
Pit River-Paute-----	16	7	9	16	7	9	---	---	4

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Sacramento Agency—Continued.												
Round Valley Reservation												
Kato.....	827	417	410	796	398	398	2	1	1	29	18	11
Maidu.....	190	102	88	189	101	88				1	1	
Mission-Pomo.....	3	1	2	3	1	2						
Papago.....	1	1			1							
Papago-Pomo.....	3		3	3		3						
Pit River.....	40	24	16	38	23	15				2	1	1
Pit River-Pomo.....	5	4	1	5	4	1						
Pomo.....	105	49	56	97	43	54				6	5	1
Pomo-Wailaki.....	25	12	13	25	12	13	2	1	1			
Pomo-Wintoon-Wailaki.....	19	8	11	19	8	11						
Wailaki.....	2	2		2	2							
Wailaki-Maidu.....	191	86	105	179	80	99				12	6	6
Wailaki-Wintoon.....	16	9	7	16	9	7						
Wailut.....	5	1	4	4		4				1		
Wintoon.....	12	9	3	10	7	3				2	2	
Wintoon-Maidu.....	111	60	51	107	59	48				4	1	3
Wintoon-Pomo.....	5	2	3	5	2	3						
Yuki.....	3	2	1	3	2	1						
Yuki-Kato.....	67	30	37	66	29	37				1	1	
Yuki-Maidu.....	4	2	2	4	2	2						
Yuki-Pomo.....	14	3	11	14	3	11						
Yuki-Wailaki.....	1		1			1						
Tulare County Indians^s	121	66	55	121	66	55						
Apache-Navajo.....	1	1		1								
Cherokee.....	2	2		2								
Cherokee-Waksachi.....	4	2	2	4	2	2						
Chuckchansi.....	1	1		1								
Intimbich.....	6	4	2	6	4	2						
Intimbich-Wikebanni.....	13	6	7	13	6	7						
Koyati.....	1	1		1								
Koyati-Waksachi.....	2	1	1	2	1	1						
Monachi.....	5	3	2	5	3	2						
Tachi.....	2	1	1	2	1	1						
Tachi-Waksachi.....	4	3	1	4	3	1						
Tachi-Wikebanni.....	5	2	3	5	2	3						
Tejon.....	19	9	10	19	9	10						
Waksachi.....	21	11	10	21	11	10						
Wikebanni.....	22	12	10	22	12	10						

Wikhamni-Cherokee.	2	6	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2</
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For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California —Continued.												
Sacramento Agency —Continued.												
Public Domain Allotments —Continued.												
San Bernardino-Tejon.....	8	2	6		8	2			6			
San Luis Rey.....	1	1	1		1				1			
Serrano.....	1	1			1							
Serrano-Tejon.....	2	1	2		2				2			
Shoshone.....	4	3	4		4	3			1			
Teton.....	38	22	16		38	22			16			
Washo.....	128	67	61		112	61			51		6	10
Wintoon.....	2	1	1		2	1			1			
Wintoon-Monachi.....	3	2	1		3	2			1			
Walker River Agency, in Nevada, and Fort Independence and Indian Ranch Reservations, Homestead Tracts, and Bishop scattered bands.												
Maidu.....	1,578	789	789		1,491	754		6	4	2	31	50
Monachi.....	5	1	3		3	2			1		2	
Paiute.....	1,324	663	661		1,242	630						
Paiute-Latona.....	2	2			2			6	4	2	29	47
Paiute-Maidu.....	19	11	8		19	11						
Paiute-Pomo.....	2	2			2							
Paiute-Shoshone.....	6	2	4		6	2						
Pomo.....	1	1			1							
Shoshone.....	189	95	94		186	93			1		2	1
Washo.....	29	13	16		29	13				3		
Colorado.												
Consolidated Ute Agency, see Utah	834	424	410		822	418		8	5	4	3	1
Southern Ute Reservation (Ute)	834	424	410		822	418		8	5	4	3	1
Ute Mountain Reservation (Ute)	389	192	197		381	188		6	3	2	1	1
Florida: Seminole Agency and Reservation (Seminole)	445	232	213		441	230		2	2	2	2	
Idaho.												
Coeur d'Alene Agency, see Washington	580	289	291		580	289			291			
Coeur d'Alene Reservation	4,187	2,074	2,113		3,538	1,745		173	100	73	229	247
Coeur d'Alene Reservation	2,150	1,023	1,127		1,742	819		119	70	49	134	155
Coeur d'Alene	634	308	326		446	218		14	9	5	81	93
Coeur d'Alene-Blackfoot	550	274	276		372	186		11	7	4	167	86
Coeur d'Alene-Cherokee	1		1							1		1
Coeur d'Alene-Chippewa	9	5	4		8	4		1	1			
Coeur d'Alene-Colville	1		1		1							
Coeur d'Alene-Cree	14	7	7		14	7		1	1			
Coeur d'Alene-Flathead	14	5	9		11	5			6		3	3

[illegible]

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Minnesota.												
Consolidated Chippewa Agency	15,200	7,644	7,556	10,840	5,597	5,243	398	189	209	3,962	1,588	2,104
Boise Fort Reservation (Chippewa)	12,680	6,352	6,328	8,875	4,583	4,292	368	177	191	3,437	1,592	1,845
Cass Lake and Winnibigoshish Reservation (Chippewa)	627	299	328	419	200	219				208	99	109
Fond du Lac Reservation (Chippewa)	514	261	253	408	245	223	16	8	8	30	8	22
Grand Portage Reservation (Chippewa)	1,298	689	609	706	387	319	2	2		590	300	290
Leech Lake Reservation (Chippewa)	377	162	215	269	124	145				108	38	70
White Earth Reservation (Chippewa)	891	453	438	797	411	386	45	18	27	49	24	25
White Oak Point Reservation (Chippewa)	8,659	4,008	4,051	5,398	2,787	2,611	304	148	156	2,357	1,073	1,284
Purchased Lands (Chippewa)	558	300	258	495	267	228	1	1		62	32	30
Pipestone School Jurisdiction and Purchased Lands (Sioux)	356	180	176	323	162	161				33	18	15
Red Lake Agency and Reservation (Chippewa)	552	278	274	148	75	73	1		1	403	203	200
Mississippi: Choctaw Agency and Purchased Lands (Choctaw)	1,968	1,014	954	1,817	939	878	29	12	17	122	63	59
Montana.												
Blackfeet Agency and Reservation	1,792	902	890	1,784	897	887	8	5	3			
Assiniboin	15,255	7,793	7,462	13,038	6,741	6,297	436	231	205	1,781	821	960
Blackfeet	3,962	2,031	1,931	3,401	1,765	1,636	36	19	17	525	247	278
Blackfeet-Crow	3,571	1,843	1,728	3,065	1,598	1,467	24	13	11	482	232	250
Blackfeet-Assiniboin	5	4	1	5	4	1						
Blackfeet-Bannock	4	3	1	4	3	1						
Blackfeet-Blood	12	5	7	7	3	4				5	2	3
Blackfeet-Cherokee	7	3	4	7	3	4						
Blackfeet-Chippewa	17	9	8	13	8	5				4	1	3
Blackfeet-Cree	256	128	128	241	121	120	1		1	14	7	7
Blackfeet-Crow	2		2				2		2			
Blackfeet-Flathead	3	3		3	3							
Blackfeet-Gros Ventre	13	7	6	4	1	3		3		6	3	3
Blackfeet-Mission	21	6	15	17	4	13	4	2	2			
Blackfeet-Nez Percé	2	2		2	2							
Blackfeet-Onetla	2	1	1				2	1	1			
Blackfeet-Piegán	5	1	4	5	1	4						
Blackfeet-Sioux	14	7	7	12	7	5				2		2
Blackfeet-Tenino (Warm Springs)	9	4	5	8	3	5				1	1	
Cherokee	3	2	1	3	2	1						
Chippewa	6	1	5							6	1	5
Cree	3		3	1		1				2		2
Gros-Ventre	4		4							3		3
Shoshone	1	1		1	1							

Crow Agency and Reservation (Crow)												
Flathead Agency and Reservation (Flathead)	2, 082	1, 053	1, 029	1, 863	949	914	31	9	22	188	95	93
Fort Belknap Agency and Reservation	1, 367	1, 514	1, 450	2, 269	1, 199	1, 070	96	56	40	599	259	340
Assinibolin	455	715	652	1, 246	223	195	7	4	10	92	44	13
Assinibolin-Blackfeet	2	244	211	418	1	1			3	30	17	
Assinibolin-Cheyenne	1		1	1		1			1			
Assinibolin-Chippewa	2	2		1	2	1						
Assinibolin-Cree	33	16	17	33	16	17						
Assinibolin-Gros Ventre	3	2	1	3	2	1			1		1	
Assinibolin-Gros Ventre-Crow	65	30	35	64	29	35			1			
Assinibolin-Nez Perce	1		1	1	1	1			1			
Assinibolin-Nez Perce-Cree	19	6	13	19	6	13				1		1
Assinibolin-Nez Perce-Gros Ventre	4	1	3	3	1	1			2			
Assinibolin-Nez Perce-Gros Ventre	7	1	6	7	1	6			6			
Assinibolin-Nez Perce-Sioux	3	1	2	2		2			7		1	
Assinibolin-Osage	1	1								1	1	
Assinibolin-Seneca	6	3	3	6	3	3				1	1	
Assinibolin-Seneca-Gros Ventre	1											
Assinibolin-Shoshone-Bannock	4		1	1		1						
Assinibolin-Sioux	37	24	13	34	22	12	3	2	1			
Assinibolin-Sioux-Gros Ventre	2	1	2	1	1	1						
Assinibolin-Washo	1									1		1
Gros Ventre	430	217	213	385	195	190	6	5	1	39	17	22
Gros Ventre-Arapaho	43	23	20	36	21	15	5	2	3	2		2
Gros Ventre-Arapaho-Assinibolin	5	3	2	5	3	2						
Gros Ventre-Arapaho-Crow	1	1		1	1							
Gros Ventre-Arapaho-Sioux	10	2	8	10	2							
Gros Ventre-Assinibolin	121	64	57	116	60	56	3	2	1	2	2	
Gros Ventre-Assinibolin-Arapaho	11		7	11	7	4						
Gros Ventre-Assinibolin-Cree	5	3	2	5	3	2						
Gros Ventre-Assinibolin-Sioux			1	1		1						
Gros Ventre-Blackfeet	6	4	2	4	2	1	3	2	1			
Gros Ventre-Cheyenne	4	2	2	4	2	2						
Gros Ventre-Chippewa	2	2		2	2	2						
Gros Ventre-Chippewa-Cree	1	1		1								
Gros Ventre-Crow	30	16	14	17	11	6						
Gros Ventre-Crow	10	6	4	10	6	4				13	5	8
Gros Ventre-Piegan	8	7	1	8	7	1						
Gros Ventre-Piegan-Assinibolin	4	2	2	4	2	2						
Gros Ventre-Puyallup	4	2	2	4	2	2						
Gros Ventre-Sioux	1	1	1							1		1
Gros Ventre-Sioux	20	14	6	18	12	6	2	2				
Gros Ventre-Tlingit	3	2	1	3	2	1						
Piegan	1	1		1	1	1						
Piegan-Cree	3	2		3								
Fort Peck Agency and Reservation	2, 663	1, 330	1, 333	2, 266	1, 143	1, 123	135	65	67	262	119	143
Assinibolin	1, 227	615	612	1, 016	516	500	56	31	25	155	68	87
Assinibolin-Sioux	234	127	107	125	125	100	4	1	3	5	1	1
Sioux	1, 202	588	614	1, 025	502	523	75	36	39	102	50	52

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Montana—Continued.												
Rocky Boys' Agency and Reservation.												
Assiniboin-Blackfeet.....	676	357	319	537	286	251	45	25	20	94	46	48
Blackfeet.....	3	1	2	3	1	2						
Blackfeet-Cree.....	19	15	4	16	13	3				3	2	1
Blackfeet-Cree-Assiniboin.....	7	3	4	4	1	3						
Blackfeet-Cree-Chippewa.....	95	51	44	60	35	25	8	5	3	6	3	3
Chippewa.....	21	12	9	21	12	9				27	11	16
Chippewa-Assiniboin.....	7	6	1	2	2		3	3		2	1	1
Chippewa-Assiniboin-Sioux.....	5	4	1	4	3	1				1	1	
Chippewa-Blackfeet.....	6	3	3	6	3	3						
Chippewa-Blackfeet-Assiniboin.....	242	115	127	188	89	99	20	9	11	34	17	17
Chippewa-Cree.....	1	1		3								
Chippewa-Cree-Arapaho.....	3		3	3		3						
Chippewa-Cree-Assiniboin.....	33	20	13	31	19	12	1	1		1		1
Chippewa-Cree-Assiniboin-Piegian.....	1	1		1								
Chippewa-Cree-Blackfeet.....	15	11	4	15	11	4						
Chippewa-Cree-Blackfeet-Piegian.....	6	3	3	2	2	2				4	3	1
Chippewa-Cree-Piegian.....	6	1	5	6	1	5						
Chippewa-Cree-Sioux.....	3	2	1	3	2	1						
Chippewa-Sioux.....	7	2	5	4	2	2						
Cree.....	50	29	21	41	23	18	3		3			
Cree-Assiniboin.....	45	21	24	44	21	23	2	1	1	7	5	2
Cree-Assiniboin-Blackfeet.....	13	7	6	13	7	6				1		1
Cree-Assiniboin-Blackfeet-Chippewa.....	3	3		3	3							
Cree-Assiniboin-Piegian.....	5	2	3	3	1	2	1	1		1		1
Cree-Blackfeet.....	5	4	1	5	4	1						
Cree-Blackfeet-Assiniboin-Piegian.....	1		1	1								
Cree-Chippewa.....	41	19	22	28	11	17	7	5	2	6	3	3
Cree-Chippewa-Assiniboin.....	5	3	2	5	3	2						
Cree-Chippewa-Blackfeet.....	10	5	5	10	5	5						
Cree-Piegian.....	2		2	1		1				1		1
Piegian-Chippewa-Assiniboin.....	6	6		6	6							
Piegian-Chippewa-Assiniboin-Cree.....	3			3								
Piegian-Chippewa-Cree.....	2	1	1	2	1	1						
Tongue River Agency and Reservation.	1,541	793	748	1,456	747	709	64	35	29	21	11	10
Cheyenne.....	1,491	764	727	1,418	726	692	52	27	25	21	11	10
Cheyenne-Arapaho.....	2	1	1				2	1	1			
Cheyenne-Arikara.....	6	2	4	6	2	4						
Cheyenne-Chippewa.....	2	1	1	2	1	1						
Cheyenne-Cree.....	9	4	5	9	4	5						

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For footnotes see p. 155

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nevada—Continued.												
Walker River Agency, see California.	1,722	878	844	1,673	854	819	45	22	23	4	2	2
Fallon Reservation.	426	217	209	412	210	202	12	6	6	2	1	1
Paiute.	421	215	206	407	208	199	12	6	6	2	1	1
Paiute-Shoshone.	1	1			1							
Shoshone.	4	1	3	4	1	3						
Mason and Smith Valleys.	440	227	213	422	219	203	18	8	10			
Maidu.	1	1		1	1							
Paiute.	427	218	209	409	210	199	18	8	10			
Paiute-Maidu.	2	2	1	2	1	1						
Paiute-Washo.	2	2		2	2							
Washo.	8	5	3	8	5							
Nye County scattered Indians.	364	184	180	364	184	180						
Paiute.	29	16	13	29	16	13						
Shoshone.	335	168	167	335	168	167						
Walker River Reservation.	492	250	242	475	241	234	15	8	7	2	1	1
Paiute.	445	226	219	428	217	211	15	8	7	2	1	1
Shoshone.	47	24	23	47	24	23						
Western Shoshone Agency and Reservation, see Idaho.	516	272	244	436	231	205	73	38	35	7	3	4
Hopi.	1		1							1		1
Hopi-Shoshone-Paiute.	8	5	3		3					4	2	2
Paiute.	84	48	36	79	44	35		4	1			
Paiute-Maidu.	1							1				
Shoshone.	246	130	116	201	106	95	43	23	20	2	1	1
Shoshone-Paiute.	175	87	88	153	78	75	22	9	13			
Shoshone-Washo.	1						1	1				
New Mexico.	34,756	17,953	16,743	34,155	17,674	16,481	112	49	63	459	260	196
Eastern Navajo Agency and Navajo Reservation (Navajo) ¹².	8,229	4,109	4,130	8,239	4,109	4,130						
Jicarilla Agency and Reservation.	680	346	334	671	339	332	7	6	1	2	1	1
Apache.	649	329	320	643	325	318	4	3	1	2	1	1
Apache-Pueblo.	14	7	7	14	7	7						
Apache-Navajo.	17	10	7	14	7	7						
Mescalero Agency and Reservation.	722	356	366	706	342	364	3	3	1	11	10	1
Apache.	712	352	360	697	338	359	4	4				
Apache-Mexican.	4	3			3							
Apache-Navajo.	4	1			1							
Apache-Pima.	4		3	4		1						
Pueblo-Mexican.	1		1				1		1			

Northern Navajo Agency and Navajo Reservation (Navajo)	8,502	4,436	4,066	8,499	4,433	4,066	3	3	39	54	31	23
Santa Fe School Jurisdiction	2,209	1,130	1,079	2,087	1,080	1,017	58	19	2	4	2	2
Name Pueblo (Pueblo)	128	62	66	120	58	62	4	2	2	4	2	2
Picuris Pueblo (Pueblo)	117	56	61	111	54	57	2					
Pojoaque Pueblo (Pueblo)	126	68	58	111	62	49	9	2	7	3	2	1
San Ildefonso Pueblo (Pueblo)	561	284	277	525	208	257	22	7	15	6	4	2
Santa Juan Pueblo (Pueblo)	400	201	199	378	187	191	13	6	7	9	9	5
Santa Clara Pueblo	389	195	194	368	181	187	12	6	6	9	8	1
Pueblo	8	4	4	7	4	3	1		1		8	1
Pueblo-Apache	3	2	1	3	2	1						
Pueblo-Navajo	745	389	356	724	384	340	8	2	6	13	3	10
Taos Pueblo (Pueblo)	123	65	58	122	64	58				1	1	
Tesuque Pueblo (Pueblo)												
Southern Navajo Agency and Navajo Reservation, in Arizona (Navajo)	4,821	2,402	2,419	4,817	2,399	2,418	2	2		2	1	1
Southern Pueblos Agency	7,502	4,043	3,549	7,106	3,836	3,270	26	6	20	370	201	169
Acoma Pueblo	1,125	677	543	1,065	543	522	26			60	34	26
Pueblo	1,120	575	545	1,063	543	520	32			57	32	25
Pueblo-Chocataw	1	1		2						1	1	
Pueblo-Navajo	4	1	3	303	163	140	2			2	2	1
Cochiti Pueblo	305	164	141	301	162	139	1			2	1	1
Pueblo	303	163	140	301	162	139	1			2	1	1
Pueblo-Hopi	2	1	1	2	1	1				2	1	
Isleta Pueblo	1,103	602	501	1,078	555	493	1			25	17	8
Navajo Pueblo	2									2	2	
Pueblo	1,100	599	501	1,078	555	493				22	14	8
Pueblo-Navajo	1	1								1	1	
Jemez Pueblo (Pueblo)	677	366	311	673	364	309				4	2	2
Laguna Pueblo	2,271	1,083	1,083	1,937	1,048	939	25	6	19	259	134	125
Pueblo	2,211	1,157	1,054	1,944	1,025	919	22	6	16	245	126	119
Pueblo-Apache	16	8	8	9	5	4				7	3	4
Pueblo-Chippewa	6	2	4	6	2							
Pueblo-Hopi	3	1	2	2	1	1	1		1			
Pueblo-Kikapoo	1		1									
Pueblo-Maidu	2	2		2	2				1			
Pueblo-Mission	7	3	4	7	3	4						
Pueblo-Navajo	20	12	8	17	10	7	1		1	2	2	1
Pueblo-Paiute	1		1							1		
Pueblo-Papago	2	2										
Pueblo-Seneca-Mohawk	2											
Sandia Pueblo (Pueblo)	129	69	60	118	62	56				11	7	4
San Felipe Pueblo	596	330	266	589	326	263	1		1	6	4	2
Pueblo	593	328	265	586	324	262	1		1	6	4	2
Pueblo-Cherokee	2	1	1	2	1	1						
Pueblo-Papago	1	1		1	1							
Santa Ana Pueblo (Pueblo)	241	146	95	241	146	95						
Santa Domingo Pueblo (Pueblo)	866	496	370	866	496	370						
Sis Pueblo (Pueblo)	189	105	84	186	103	83				3	2	1

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
New Mexico—Continued.												
Zuni Agency and Pueblo....	2,051	1,161	890	2,020	1,136	884	11	9	2	20	16	4
Hopi.....	1		1	1		1						
Klamath.....	1		1				1		1			
Navajo.....	4		4	4								
Pima.....	2		2									
Pueblo.....	2,043	1,161	882	2,014	1,136	878	10	9	1	19	16	3
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	3,254	1,724	1,530	2,409	1,250	1,120				854	444	410
North Dakota	10,287	5,218	5,069	6,642	3,390	3,252	173	91	82	3,472	1,737	1,735
Fort Berthold Agency and Reservation	1,569	769	800	1,585	739	769	16	10	6	45	20	25
Arikara.....	514	249	265	485	238	247	4	1	3	25	10	15
Arikara-Cheyenne.....	1		1				1		1			
Arikara-Chippewa.....	11	6	5	11	6	5						
Arikara-Gros Ventre.....	18	2	16	18	2	16						
Arikara-Gros Ventre-Mandan.....	2	1	1	2	1	1						
Arikara-Mandan.....	2	2		2	2							
Arikara-Navajo.....	1		1	1								
Arikara-Oneldia.....	1		1									
Arikara-Sioux.....	8	5	3	8	5	3						
Gros Ventre.....	645	316	329	630	307	323	2	2		13	7	6
Gros Ventre-Arapaho.....	1		1							1		1
Gros Ventre-Chippewa.....	10	7	3	10	7	3						
Gros Ventre-Mandan.....	16	8	8	16	8	8						
Gros Ventre-Sioux.....	13	7	6	11	6	5	2	1	1			
Gros Ventre-Winnebago.....	2	1	1							2	1	1
Mandan.....	280	141	139	274	138	136	2	1	1	4	2	2
Mandan-Arikara.....	3	2	1	3	2	1						
Mandan-Chinook.....	1	1		1	1							
Mandan-Chippewa.....	1		1	1								
Mandan-Gros Ventre.....	22	9	13	22	9	13						
Mandan-Sioux.....	16	11	5	11	6	5	5	5				
Mandan-Unknown tribe.....	1	1		1	1							
Fort Totten Agency and Devils Lake Reservation (Sioux)	960	496	464	878	456	422	37	18	19	45	22	23
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	47	29	18	47	29	18						
Standing Rock Agency and Reservation, see South Dakota (Sioux)	1,677	833	844	1,549	773	776	44	20	24	84	40	44
Turtle Mountain Agency and Reservation (Chippewa)	6,034	3,091	2,943	2,660	1,393	1,267	76	43	33	3,298	1,655	1,643

Oklahoma.	22,354	11,226	11,128	16,604	8,379	8,225	685	336	349	5,065	2,511	2,554
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)												
Kiowa Agency	2,760	1,423	1,337	2,443	1,247	1,196	134	70	64	183	106	77
Kiowa Reservation	5,953	2,899	3,054	5,816	2,829	2,829	28	18	10	109	52	57
Apache	4,543	2,222	2,321	4,455	2,291	2,291	13	6	7	45	22	23
Apache-Comanche	162	139	139	299	160	139	1	1		1	1	
Apache-Kiowa	2	1	1	2								
Comanche	14	7	7	14	7	7						
Comanche-Apache	2,035	997	1,038	2,008	986	1,022	3		3	24	11	13
Comanche-Caddo	16	9	3	16	9	7						
Comanche-Kiowa	36	8	19	36	17	19						
Kiowa	2,083	1,003	1,080	2,054	988	1,066	9	5	4	20	10	10
Kiowa-Apache	20	10	10	20	10							
Kiowa-Cheyenne	4	2	2	4	2	2						
Kiowa-Comanche	24	9	15	24	9	15						
Wichita Reservation	1,410	677	733	1,331	635	696	15	12	3	64	30	34
Caddo	799	391	408	736	358	378	10	8	2	53	25	28
Caddo-Delaware	107	52	55	107	52	55						
Delaware	5	2	3	5	2	3						
Delaware-Wichita	114	51	63	114	51	63						
Delaware-Caddo	24	13	11	24	13							
Delaware-Shawnee	3	1	2	3	1	2						
Wichita	350	164	186	334	155	179	5	4	1	11	5	6
Wichita-Caddo	3	1	2	3	1	2						
Wichita-Creek	1	1	1	1	1							
Wichita-Delaware	2	1	1	2	1							
Wichita-Kiowa	1	1	1	1	1							
Wichita-Otoe	1											
Osage Agency and Reservation	3,560											
Osage	3,382	1,521	1,739	1,977	1,045	932	5	2	3	1,578	774	804
Osage-Bannock	7	5	1,646	1,835	1,977	868	4	2	2	1,543	757	786
Osage-Blackfeet	2		2			2				7	5	2
Osage-Cayuga	2		2			2				2	1	1
Osage-Cherokee	4	2	2	2	1	1				2	3	4
Osage-Cheyenne	24	8	16	17	5	12				7	1	1
Osage-Chippewa-Wyandotte	6	3	3	4	2	2				2	1	2
Osage-Creek	4	2	2							4	2	1
Osage-Delaware	2	1	1	1	1					1		
Osage-Iowa	2	1	1	2	1	1						
Osage-Kaw	1	1		1	1							
Osage-Navajo	4	3	1	4	3	1						
Osage-Omaha	3		3			3						
Osage-Omaha-Sac and Fox	15	6	9	13	6	7				2		2
Osage-Oneida	2		2							2		2
Osage-Otoe	2	2		2	2					1	1	
Osage-Pawnee	7	3	4	6	4	4						
Osage-Peoria	2	1	1	2	1	1						
Osage-Ponca	1	1								1	1	
Osage-Potawatomi	5	4	1	5	4	1						
	21	9	12	21	9	12						

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Osage Agency and Reservation—Continued.												
Osage-Pueblo.....	19	12	7	17	10	7	---	---	---	2	2	---
Osage-Quapaw.....	15	9	6	13	9	4	1	---	1	1	---	1
Osage-Quapaw-Minsee.....	2	---	2	2	---	2	---	---	---	---	---	---
Osage-Sac and Fox.....	3	2	1	2	2	---	---	---	---	---	---	---
Osage-Seneca.....	3	3	---	3	3	---	---	---	---	---	---	---
Osage-Shawnee.....	3	3	---	3	3	---	---	---	---	---	---	---
Osage-Sioux.....	19	7	12	16	6	10	---	---	---	3	1	2
Osage-Wyandotte.....	1	---	---	1	---	---	---	---	---	---	---	---
Pawnee Agency.	2,981	1,506	1,475	2,355	1,202	1,153	196	98	98	430	206	224
Kaw Reservation.	507	265	242	289	154	135	44	21	23	174	90	84
Kaw.....	366	194	172	197	106	91	35	20	15	134	68	66
Kaw-Cherokee.....	6	4	2	2	2	---	---	---	---	4	2	2
Kaw-Cherokee.....	2	1	1	1	---	1	---	---	---	1	1	---
Kaw-Chickasaw.....	2	1	1	---	---	---	---	---	---	2	1	1
Kaw-Creek.....	1	---	1	---	---	---	---	---	---	1	---	---
Kaw-Neida.....	8	3	5	6	3	3	---	---	---	2	---	2
Kaw-Osage.....	9	3	6	8	3	5	1	---	1	---	---	---
Kaw-Osage-Potawatomi.....	2	2	---	---	---	---	---	---	---	2	2	---
Kaw-Ponca.....	3	3	---	3	3	---	---	---	---	---	---	---
Kaw-Ponca.....	3	3	---	3	3	---	---	---	---	---	---	---
Kaw-Potawatomi.....	97	47	50	67	35	32	8	1	7	22	11	11
Kaw-Potawatomi-Cherokee.....	5	3	2	4	2	1	---	---	---	1	1	---
Kaw-Shawnee.....	6	4	2	1	---	1	---	---	---	5	4	1
Oakland Reservation.	46	25	21	35	19	16	4	3	1	7	3	4
Tonkawa.....	22	11	11	19	9	10	2	2	---	1	---	1
Tonkawa-Kiowa.....	1	---	1	1	---	1	---	---	---	---	---	---
Tonkawa-Ponca.....	6	4	2	6	4	2	---	---	---	---	---	---
Tonkawa-Potawatomi.....	1	---	1	1	---	1	---	---	---	---	---	---
Tonkawa-Quapaw.....	1	1	---	1	---	---	---	---	---	---	---	---
Tonkawa-Seminole.....	2	1	1	1	---	1	2	1	1	---	---	---
Tonkawa-Shawnee.....	9	4	5	3	1	2	---	---	---	6	3	3
Otoe Reservation.	5	5	---	5	5	---	---	---	---	---	---	---
Otoe.....	722	370	352	551	282	269	67	34	33	104	54	50
Otoe-Caddo.....	490	256	234	373	198	175	35	20	15	82	38	44
Otoe-Cherokee.....	2	1	1	1	---	---	1	1	---	---	---	---
Otoe-Chippewa.....	3	1	2	3	1	2	---	---	---	---	---	---
Otoe-Iowa.....	13	5	8	13	5	8	---	---	---	---	---	---
Otoe-Iowa-Chickasaw.....	116	55	61	95	45	50	13	5	8	8	5	3
Otoe-Iowa-Delaware.....	4	1	3	4	1	3	---	---	---	---	---	---
Otoe-Iowa-Osage.....	1	---	1	---	---	---	1	---	1	---	---	---
Otoe-Kaw.....	5	4	1	---	---	---	5	4	1	---	---	---
Otoe-Kaw.....	14	8	6	10	5	5	---	---	---	4	3	1

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Pawnee Agency—Continued.												
Ponca Reservation	800	396	404	747	371	376	38	21	17	15	4	11
Ponca-Cherokee	735	359	376	702	343	359	25	13	12	8	3	5
Ponca-Chippewa	1	1										
Ponca-Creek	2	2		2	2							
Ponca-Delaware	2	1	1	2	1	1						
Ponca-Kaw	6	4	2	5	4	1				1		1
Ponca-Kiowa	1		1	1		1						
Ponca-Omaha	19	10	9	16	9	7	3	1	2	1		
Ponca-Osage	5	3	2				5	3	2			
Ponca-Otoe	9	5	4	7	4	3	2	1	1			
Ponca-Potawatomi	4	3	1	4	3	1						
Ponca-Seneca	6	1	5							6	1	5
Ponca-Shawnee	1	1					1	1				
Ponca-Sioux	2	2					2	2				
Ponca-Tonkawa	6	3	3	6	3	3						
Quapaw Agency	2,576	1,264	1,312	1,411	704	707	235	110	125	930	450	480
Eastern Shawnee Reservation (Shawnee)	262	122	140	166	81	85	25	14	11	71	27	44
Ottawa Reservation (Ottawa)	388	204	184	216	111	105	7	4	3	165	89	76
Quapaw Reservation (Quapaw)	528	252	276	325	157	168	16	9	7	187	86	101
Seneca Reservation (Seneca)	697	345	352	398	194	204	120	54	66	179	97	82
Wyandotte Reservation (Wyandotte)	701	341	360	306	161	145	67	29	38	328	151	177
Shawnee Agency	4,574	2,313	2,261	2,692	1,352	1,340	87	38	49	1,835	923	912
Iowa Reservation (Iowa)	108	52	56	107	52	55	1		1	1		1
Kickapoo Reservation (Kickapoo)	258	139	119	249	134	115	59	26	33	1,701	868	833
Potawatomi Reservation (Potawatomi)	2,714	1,386	1,328	954	492	462	14	5	9	1,103	38	65
Sac and Fox Reservation (Sac and Fox)	831	416	415	714	373	341	14	7	7	21	12	9
Shawnee Reservation (Shawnee)	613	320	293	578	301	277	14	7	7	873	367	506
Oregon	4,644	2,266	2,378	3,428	1,720	1,708	343	179	164	248	98	150
Klamath Agency and Reservation	1,364	661	703	1,065	555	510	51	28	23	96	34	62
Klamath	401	194	207	304	160	144	1		1			
Klamath-Chocaw	4	2	2	4	2	2						
Klamath-Cree	1	1								1	1	
Klamath-Iroquois	1		1	1	1							
Klamath-Kikitat	1	1		1	1							
Klamath-Kikitat-Puyallup-Pit River	1											
Klamath-Kusa	6	5		6	5							
Klamath-Modoc	193	98	95	186	98	88				7		7
Klamath-Modoc-Cherokee	2		2	2		2						
Klamath-Modoc-Molala	12	4	8	12	4	8						

Klamath-Modoc-Pit River.....	44	19	25	43	18	25	---	---	---	1	1	---	---
Klamath-Modoc-Pit River-Hoopa.....	1	1	1	1	1	1	---	---	---	1	---	---	1
Klamath-Modoc-Seminole.....	1	---	1	---	---	---	---	---	---	---	---	---	---
Klamath-Modoc-Shoshone.....	1	---	1	1	---	---	---	---	---	---	---	---	---
Klamath-Modoc-Wasco-Tenino (Warm Springs).....	2	---	2	---	---	---	---	---	---	---	---	---	---
Klamath-Molala.....	21	12	9	17	10	7	---	---	---	2	4	2	2
Klamath-Molala-Wasco.....	2	1	1	2	1	1	---	---	---	---	---	---	---
Klamath-Paite.....	12	4	8	9	3	6	---	---	---	---	---	---	---
Klamath-Pima-Papago.....	7	4	3	---	---	---	---	---	---	---	---	---	---
Klamath-Pit River-Hoopa.....	1	1	1	1	1	1	---	---	---	---	---	---	---
Klamath-Pit River-Karok.....	1	1	1	2	1	1	---	---	---	---	---	---	---
Klamath-Pit River-Paite.....	1	1	1	5	1	4	---	---	---	---	---	---	---
Klamath-Rogue River.....	13	5	8	1	1	1	---	---	---	1	11	3	8
Klamath-Rogue River-Modoc.....	2	2	---	2	2	---	---	---	---	---	---	---	---
Klamath-Shasta.....	27	10	17	27	10	1	---	---	---	---	---	---	---
Klamath-Shasta-Pit River.....	1	1	1	1	---	1	---	---	---	---	---	---	---
Klamath-Stoux.....	1	1	---	1	1	---	---	---	---	---	---	---	---
Klamath-Tenino (Warm Springs).....	10	6	4	2	1	1	---	---	---	---	8	5	3
Klamath-Umpqua.....	1	1	1	1	1	---	---	---	---	---	---	---	---
Klamath-Umpqua-Pit River.....	2	1	1	2	1	1	---	---	---	---	---	---	---
Klamath-Wasco.....	9	6	3	6	3	3	---	---	---	3	---	---	---
Klamath-Wasco-Chippewa.....	1	1	1	1	---	1	---	---	---	---	---	---	---
Klamath-Yakima.....	4	1	3	1	---	1	---	---	---	---	3	1	2
Klamath-Yaqui.....	3	---	3	3	---	3	---	---	---	---	---	---	---
Klamath-Yaqui-Pit River.....	1	---	1	1	---	1	---	---	---	---	---	---	---
Modoc-Cherokee.....	203	97	106	138	65	73	16	10	6	49	22	---	27
Modoc-Karok.....	3	1	2	2	2	---	3	1	2	1	2	---	2
Modoc-Karok-Paite.....	7	4	3	---	---	---	1	---	1	4	---	---	---
Modoc-Karok-Pit River.....	1	---	1	1	---	1	---	---	---	---	---	---	---
Modoc-Karok-Pit River.....	1	---	1	1	---	1	---	---	---	---	---	---	---
Modoc-Karok-Washo.....	3	3	1	3	3	---	---	---	---	---	---	---	---
Modoc-Miwok.....	1	1	---	1	1	---	---	---	---	---	---	---	---
Modoc-Molala.....	1	---	1	1	1	---	---	---	---	---	---	---	---
Modoc-Paite.....	47	21	26	45	21	1	---	---	---	2	---	2	1
Modoc-Peoria.....	2	---	1	---	---	---	---	---	---	2	1	---	---
Modoc-Pit River.....	35	14	21	32	12	20	1	1	1	2	2	---	---
Modoc-Quapaw.....	2	1	1	---	---	---	---	---	---	---	---	---	---
Modoc-Rogue River.....	7	4	3	7	4	3	2	1	---	---	---	---	---
Modoc-Seneca.....	1	---	1	---	---	---	---	---	---	---	---	---	---
Modoc-Tenino (Warm Springs).....	2	2	---	---	---	---	2	2	---	1	---	---	1
Modoc-Wyandotte.....	1	---	1	---	---	---	---	---	---	---	---	---	---
Paite.....	91	49	42	69	37	32	17	10	7	5	2	3	3
Paite-Klamath-Cherokee.....	6	3	3	1	1	---	---	---	---	5	2	---	---
Paite-Miwok.....	9	7	2	9	7	2	---	---	---	5	2	3	3
Paite-Modoc-Klamath.....	33	14	19	30	13	17	---	---	---	3	1	---	2
Paite-Wasco.....	1	---	1	1	---	1	---	---	---	---	---	---	---
Pit River.....	18	10	8	13	9	4	---	---	---	---	---	---	---
Pit River-Klamath.....	36	18	18	30	16	14	---	---	---	6	1	4	4
Pit River-Klamath-Rogue River.....	1	1	1	1	16	1	---	---	---	6	2	---	---
Pit River-Modoc-Hoopa.....	15	7	8	1	---	1	---	---	---	15	7	---	8

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Klamath Agency and Reservation—Con.												
Pit River-Modoc-Klamath-Molala	5	1	4	5	1	4						
Pit River-Modoc-Paite	2		2	2		2						
Pit River-Paite	3	1	2	3	1	2						
Pit River-Paite-Klamath-Modoc	24	16	8	24	16	8						
Shasta	7	4	3									
Salem School Jurisdiction	1,148	595	553	841	452	389	75	43	32	7	4	3
Grand Ronde Reservation	356	189	167	210	119	91	39	24	15	232	100	132
Calapooya	26	15	11	23	14	9	2	1	1	107	46	61
Calapooya-Upper Chinook	5	4	1	3						2	1	1
Clackamas	56	27	29	24	14	10	10	6	4	22	7	15
Clackamas-Rogue River	14	7	7	14								
Clackamas-Rogue River-Santiam	4	3	1	4	3	1						
Clackamas-Santiam	10	3	7	6	1	5				4	2	2
Clowewalla	1		1				1	1				
Iroquois	2	1	1							2	1	1
Lakmiut	4	3	1	1	1		3	2	1			
Mary's River	23	15	8	17	12	5	1		1	5	3	2
Mary's River-Shasta	4	2	2	4	2	2						
Molala	5	2	3	1								
Rogue River	40	24	16	20	11	9	8	5	3	4	2	2
Rogue River-Santiam-Umpqua	3	1	2	3	1	2				12	8	4
Rogue River-Shasta	11	8	3	11	8	3						
Rogue River-Upper Chinook	3	1	2									
Santiam	13	8	5	4	2	2	4	2	2	3	1	2
Santiam-Rogue River	5	1	4	5	1	4				5	4	1
Santiam-Tulatin	3		3									
Santiam-Umpqua	12	7	5	8		4	2	2		3		3
Shasta	17	11	6	8	4	4	3	3		2	1	1
Shasta-Santiam	1		1							6	4	2
Shasta-Umpqua	5	2	3	1						1		1
Umpqua	56	25	31	32	15	17	2	1	1	22	9	13
Umpqua-Galice Creek	1		1	1								
Umpqua-Rogue River	3	2	1	2	2	1				1		1
Upper Chinook	8	3	5	5	2	3				1	1	1
Wapato	17	10	7	8	8		1	1		7	1	6
Wapato-Umpqua	2		2	2								
Wasco	2	1	1							2		1
Siletz Reservation	465	234	231	339	175	164	28	12	16	98	47	51
Alsea	8	5	3	3	1	2	1	1		2	2	
Calapooya	10	4	6	5	3	2	4		4	1		4

	27	9	18	22	8	14		5	1	4
Chastaacosta.....										
Chastaacosta-Cowlitz.....		2	2	4	2	2		3	2	1
Chetco.....	11	5	6	8	3	5				1
Chetco-Klamath.....	1	1		1	1					
Chetco-Klikitat.....	6	4		6	4	2		2	2	
Coquille.....	8	5	3	3	3	3		2	1	
Dakubetede.....	13	6	7	12	5	7		1		
Dakubetede-Walla Walla.....	1							1		1
Galice Creek.....	22	11	11	19	10	9		2	1	1
Galice Creek-Umpqua.....	14	6	8	5	2	3		9	4	1
Galice Creek-Wapato.....	2	2								
Galice Creek-Yuchi.....	4				2	2		2	2	
Joshua.....	21	10	11	8	5	3				
Joshua-Chetco.....	13	8	5	1	1					
Joshua-Clatsop.....	5	1	4			1				
Joshua-Dakubetede.....	1									
Joshua-Piegan.....	2	2	1	1				2	2	
Joshua-Smith River.....	1	1								
Klamath.....	48	31	17	35	24	11		1	7	6
Klamath-Cowlitz.....	1			1						
Klamath-Rogue River.....	2	1	1	2	1					
Klikitat.....	3	1				1			1	
Kusa.....	9	4	5	7	4	3		1	1	2
Kusa-Chastaacosta.....	3	2	1	3	2	1				
Kwatami.....	9	6	3	7	6	1		2		2
Kwatami-Umpqua.....	9	4	5	9	4	5				
Meguenodon.....	35	21	14	21	13	8		14	8	6
Meguenodon-Hoopa.....	7	2	5	7	2					
Meguenodon-Kusa.....	2	1	1	2	1					
Meguenodon-Shasta.....	2		7	7	2	7				
Meguenodon-Yuchi.....	2				2					
Natunnetunne.....	5	3	2	5	3	2				
Natunnetunne-Kusa.....	3	1	2	3	1					
Rogue River.....	49	27	22	42	22	20		1	4	2
Salmon River.....	1	1		1	1					
Salmon River-Meguenodon.....	2	2		2	2					
Shasta.....	2	1	1	2	1	1		1	1	
Shasta-Chastaacosta.....	8	6	2	8	6	2		2		
Smith River.....	4	2	2					1	1	2
Tillamook.....	1							3	1	
Tuturni.....	43	16	27	35	15	20		5	1	2
Tutunne-Chetco.....	7	3	4			4				
Umpqua.....	15	7	8	11	5	6			2	2
Yaguina.....	2	2			2			4		
Yaguina-Alsea.....	4	2		4	2					
Yuchi.....	6	1	5	5	1	4		1		1
Unknown.....	2		2					2		2

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934.—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Salem School Jurisdiction—Continued.												
Fourth Section Allottees (Public Domain)												
Calapooya.....	327	172	155	292	156	134	8	7	1	27	7	20
Cherokee.....	18	12	6	18	12	6						
Cowlitz.....	1	1		1	1							
Cowlitz-Klamath.....	4	2	2	4	2	2						
Klamath.....	51	25	26	39	20	19	3	3		9		7
Kusa.....	57	26	31	55	24	31	1	1		1	1	
Mission.....	1			1								
Rogue River.....	68	37	31	65	37	28				3		3
Rogue River-Mission.....	3	1	2	3	1	2						
Suslaw.....	10	7	3	10	7	3						
Spokane.....	4	3	1	4	3	1						
Tututni.....	17	6	11	7	3	4				10	3	7
Tututni-Kusa.....	1	1		1								
Umpqua.....	43	25	18	37	21	16	3	3		3	1	2
Upper Chinook.....	1	1		1								
Unknown.....	43	21	22	41	21	20	1		1	1		1
Umatilla Agency and Reservation	1,140	532	608	660	322	338	140	68	72	340	142	198
Cayuse.....	122	50	72	88	38	50	11	7	4	23	5	18
Cayuse-Colville.....	13	6	7	13	6	7						
Cayuse-Colville-Paloos.....	1	1	1	1		1	1	1				
Cayuse-Colville-Tenino (Warm Springs).....	1	1	1	1		1						
Cayuse-Flathead.....	1			1			1	1		1		1
Cayuse-Nez Perce.....	38	18	20	22	11	11	15	7	8	1		
Cayuse-Nez Perce-Cree.....	3	2	1	3	2	1						
Cayuse-Nez Perce-Flathead.....	2	1	1	1			2	1	1			
Cayuse-Nez Perce-Makah.....	1			1								
Cayuse-Nez Perce-Yakima.....	5			5								
Cayuse-Umatilla.....	32	15	17	27	12	15	3	2	1	2	1	2
Cayuse-Umatilla-Nez Perce.....	22	10	12	11	6	5	7	2	5	4	2	2
Cayuse-Umatilla-Nez Perce-Sac and Fox.....	3	1	2	2						3	1	2
Cayuse-Umatilla-Walla Walla.....	12	7	5	8	5	3	1		1	3	2	1
Cayuse-Umatilla-Walla Walla-Nez Perce.....	7	5	2	6	5	1				1		1
Cayuse-Umatilla-Walla Walla-Paloos.....	4	1	3	4		3						
Cayuse-Umatilla-Yakima.....	1	1		1								
Cayuse-Walla Walla.....	52	25	27	46	23	23	3		3	3	2	1
Cayuse-Walla Walla-Colville.....	4	1	3	4	1							
Cayuse-Walla Walla-Nez Perce.....	4		4	1		1	3		3			

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For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oregon—Continued.												
Warm Springs Agency and Reservations—Continued.												
Tenino-(Warm Springs) Klamath.....	1	1	—	—	—	—	—	—	—	—	—	—
Tenino-(Warm Springs) Klikitat.....	1	—	1	1	1	—	—	—	—	—	—	—
Tenino-(Warm Springs) Nez Perce-Wasco.....	2	—	—	2	—	—	—	—	—	—	—	—
Tenino-(Warm Springs) Siletz.....	1	1	—	1	1	—	—	—	—	—	—	—
Tenino-(Warm Springs) Umatilla.....	6	4	2	4	3	1	2	1	1	—	—	—
Tenino-(Warm Springs) Upper Chinook.....	4	4	—	4	4	—	—	—	—	—	—	—
Tenino-(Warm Springs) Wasco-Paiute.....	5	4	1	5	4	1	—	—	—	—	—	—
Tenino-(Warm Springs) Wasco-Yakima.....	10	3	7	10	3	7	—	—	—	—	—	—
Tenino-(Warm Springs) Yakima.....	14	7	7	14	7	7	—	—	—	—	—	—
Tenino-(Warm Springs) Yakima-Klikitat.....	1	—	1	1	—	—	—	—	—	—	—	—
Upper Chinook.....	4	2	2	4	2	2	—	—	—	—	—	—
Wasco.....	94	45	49	73	35	38	7	3	4	14	7	7
Wasco-Puyallup.....	7	6	1	—	—	—	—	—	—	—	—	—
Wasco-Tenino (Warm Springs).....	97	48	49	91	45	46	3	2	1	7	6	1
Wasco-Tenino-(Warm Springs) Klamath.....	1	1	—	1	1	—	—	—	—	—	—	—
Wasco-Tenino-(Warm Springs) Umatilla.....	4	3	1	4	3	1	—	—	—	—	—	—
Wasco-Tenino-(Warm Springs) Upper Chinook.....	3	3	—	3	3	—	—	—	—	—	—	—
Wasco-Umatilla.....	1	1	—	1	1	—	—	—	—	—	—	—
Wasco-Upper Chinook.....	2	1	1	1	1	—	—	—	—	—	—	—
Wasco-Yakima.....	5	3	2	3	3	—	1	—	1	—	—	—
Yakima.....	6	3	3	6	3	3	—	—	—	2	—	—
Unknown.....	2	1	1	2	1	1	—	—	—	—	—	—
South Dakota	26,695	13,682	13,013	23,177	11,949	11,227	998	485	513	2,520	1,237	1,283
Cheyenne River Agency and Reservation.	3,288	1,713	1,575	2,780	1,458	1,322	245	129	116	263	126	137
Sioux.....	3,266	1,699	1,567	2,763	1,449	1,314	240	124	116	263	126	137
Sioux-Chippewa.....	14	6	8	14	6	8	—	—	—	—	—	—
Sioux-Choctaw.....	2	2	—	2	2	—	—	—	—	—	—	—
Sioux-Creek.....	1	1	—	1	1	—	—	—	—	—	—	—
Sioux-Shawnee.....	4	4	—	—	—	—	4	4	—	—	—	—
Sioux-Yuma.....	1	—	—	—	—	—	—	—	—	—	—	—
Crow Creek Agency	1,556	785	771	1,229	621	608	1	1	—	182	107	75
Crow Creek Reservation (Sioux)	933	464	469	803	391	414	65	21	88	—	—	—
Lower Brule Reservation (Sioux)	603	321	282	424	230	194	80	36	44	99	55	41
Flandreau School Jurisdiction and Purchased Lands (Sioux)	345	186	159	169	98	71	40	21	19	136	67	69
Pine Ridge Agency and Reservation	3,370	4,303	4,067	7,844	4,060	3,784	93	42	51	232	201	211
Sioux.....	8,245	4,241	4,004	7,767	4,020	3,747	83	37	46	395	184	211
Sioux-Arapaho.....	7	2	5	5	2	3	2	—	—	2	—	2

Sioux-Cherokee.....	22	12	10	18	10	8	2	1	4	2	8
Sioux-Cheyenne.....	21	11	10	10	4	6	1	1	9	6	3
Sioux-Chippewa.....	6	3	3	6	3	3					
Sioux-Crow.....	11	6	5	4	3	1	7	3	3		
Sioux-Hopi.....	3	1	2							1	2
Sioux-Iroquois.....	2	1	1								
Sioux-Menominee.....	3	2	1	2	1	1					
Sioux-Nez Percé.....	1	1	1	3							
Sioux-Omaha.....	2	1	1	2					1		1
Sioux-Onida.....	19	11	8	12	7	1					
Sioux-Osage.....	8	3	5	3	1	6			7	4	3
Sioux-Ponca.....	6	3	3	6	3	2	1	1	4	1	3
Sioux-Potawatomi.....	1	1	1	1		1					
Sioux-Walapai.....	5	1	4								
Sioux-Wichita.....	2	4	2	2		2			5	1	4
Sioux-Winnebago.....	4		3	3							
Sioux-Unknown tribe.....	2	1							1		
Rosebud Agency ¹¹	8,380	4,268	4,112	7,474	3,821	3,653	245	117	661	330	331
Rosebud Reservation (Sioux).....	6,362	3,257	3,107	5,997	3,055	2,942	87	47	278	153	135
Yankton Reservation (Sioux).....	2,018	1,013	1,005	1,477	766	711	158	70	383	177	206
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)											
Standing Rock Agency and Reservation, in North Dakota (Sioux).....	2,665	1,368	1,290	1,854	972	882	142	71	662	325	337
Utah ¹	2,098	1,059	1,039	1,827	910	917	88	48	183	101	82
Consolidated Ute Agency, in Colorado, and Public Domain Allotments (Ute).....	2,124	1,101	1,023	1,965	1,019	946	48	28	111	54	57
Fort Hall Agency, in Idaho, and Washakie Subagency (Shoshone).....	43	26	17	43	26	17					
Paute Agency, see Arizona and Nevada											
Goshute.....	137	64	73	112	52	60	21	12	4		4
Goshute-Shoshone.....	382	188	194	319	155	164	3	1	60	32	28
Goshute-Shoshone.....	155	81	73	145	78	72	2	1	8	7	1
Goshute-Shoshone.....	153	81	72	143	73	70	2	1	8		1
Kanosh Reservation.....	2	2	2	2		2					
Utah ¹	24	9	15	22	7	15			2	2	
Paute.....	1	1	1	1		1					
Ute.....	17	7	10	15	5	10			2	2	
Ute-Paute.....	6	2	4	6	2	4					
Kooshareen Reservation (Ute).....	30	14	16	29	14	15			1		1
Paute Reservation (Paute).....	19	11	8	13	8	5			3	3	3
Shirwis Reservation (Paute).....	79	37	42	71	36	35			8	1	7
Skull Valley Reservation (Goshute).....	41	18	23	39	17	22	1	1	1	1	
Gandy (Homestead) (Paute).....	6	4	2						6	4	2
Cedar City (Church property) (Paute).....	28	14	14						28	14	14
Utah and Ouray Agency and Reservation (Ute).....											
Western Navajo Agency, in Arizona, and Western Navajo Reservation ²	1,251	660	591	1,180	623	557	24	15	47	22	25
Navajo.....	311	163	148	311	163	148					
Paute.....	307	160	147	307	160	147					
	4	3	1	4	3	1					

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington												
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation.....	12,907	6,401	6,506	9,135	4,586	4,549	220	86	134	3,552	1,729	1,823
Kalispel.....	88	47	41	86	47	39	2	2	2			
Kalispel-Coeur d'Alene.....	64	31	33	62	31	31	2					
Kalispel-Flathead.....	11	7	4	11	7	4						
Kalispel-Spokane.....	10	6	4	10	6	4						
Colville Agency	3,925	1,956	1,969	3,163	1,625	1,538	144	56	88	618	275	343
Colville Reservation (Colville).....	3,118	1,577	1,541	2,564	1,327	1,237	88	33	55	466	217	249
Spokane Reservation.....	807	379	428	599	301	298	56	23	33	152	58	94
Spokane.....	754	351	403	560	275	285	43	19	24	151	57	94
Spokane-Coeur d'Alene.....	29	16	13	20	13	7	9	3	6			
Spokane-Colville.....	18	10	8	17	9	8						
Spokane-Flathead.....	3	2	1	1	1		2	1	1			
Spokane-Kalispel.....	2		2				2					
Spokane-Nez Perce.....	1											
Taholah Agency	2,432	1,245	1,207	1,407	739	668	19	10	9	1,096	496	530
Chehalis Reservation (Chehalis).....	29	22	7	20	17	3						
Makah Reservation ".....	403	216	187	339	185	154	2		2	62	31	31
Makah.....	370	197	173	310	169	141	2		2	58	28	30
Makah-Clallam.....	20	12	8	16	9	7				4	3	1
Makah-Lummi.....	6	4	2	6	4	2						
Makah-Pueblo.....	1	1		1	1							
Makah-Rogue River.....	3	1	2	3	1	2						
Makah-Snohomish.....	3	1	2	3	1	2						
Nisqually Reservation (Nisqually)	63	36	27	53	32	21				10	4	6
Ozette Reservation (Makah) ".....	2	2		2								
Quinalt Reservation	1,727	855	872	801	403	398	12	8	4	914	444	470
Chehalis.....	73	35	38	36	14	22				37	21	16
Chehalis-Cherokee.....	3	2	1				1			3	2	1
Chehalis-Cowlitz.....	1		1	1		1						
Chehalis-Dwamish-Yakima.....	3	3								3	3	
Chehalis-Nisqually.....	6	1	5	6	1	5						
Chehalis-Nisqually-Puyallup.....	7	4	3	7	4	3						
Chehalis-Puyallup.....	1		1	1		1						
Chehalis-Quinalt.....	3	2	1							3	2	1
Chehalis-Skokomish.....	4	4		1	1					3	3	
Chehalis-Snohomish.....	4		4			1						3
Cowlitz.....	19	8	11	6	2	4				13	6	7
Dwamish-Snoqualmu.....	1		1	1		1						
Hoh.....	4	4		4	4					6	4	
Quileute.....	242	128	114	235	123	112	1	1				2

Quileute-Clallam	1	1	1	16	2	14	1	1	1	10	6	4
Quileute-Nakan	16	2	14	1	1	1	1	1	1	10	6	4
Quileute-Puyallup	10	6	4	2	1	1	1	1	1	10	6	4
Quileute-Tulalip	2	1	1	2	1	199	6	4	2	432	207	225
Quinalt	841	415	426	403	204	5	3	5	5	8	7	3
Quinalt-Chehalis	13	5	8	8	3	1	1	1	1	11	7	1
Quinalt-Chehalis-Puyallup	8	7	1	2	1	1	1	1	1	11	7	2
Quinalt-Clatsop	2	1	2	3	1	2	1	1	1	11	7	4
Quinalt-Cowlitz	15	9	6	3	1	2	1	1	1	11	7	4
Quinalt-Cowlitz-Dwamish	1	1	1	1	1	1	1	1	1	11	7	4
Quinalt-Cowlitz-Puyallup	2	1	1	1	1	1	1	1	1	11	7	4
Quinalt-Dwamish-Yakima	2	2	2	2	2	2	2	2	2	2	2	2
Quinalt-Makah	8	3	5	4	2	2	2	2	2	2	2	2
Quinalt-Nisqually	3	3	2	2	1	1	1	1	1	1	1	1
Quinalt-Paiute	3	2	1	2	3	2	1	1	1	1	1	1
Quinalt-Quileute	23	13	10	23	13	10	10	10	10	10	10	10
Quinalt-Skokomish	15	9	6	9	5	4	4	4	4	4	4	4
Quinalt-Snohomish	3	2	1	3	2	1	1	1	1	1	1	1
Quinalt-Squaxin	6	3	3	3	2	2	2	2	2	2	2	2
Quinalt-Upper Chinook	246	124	122	10	7	3	3	3	3	3	3	3
Quinalt-Yakima	10	7	3	8	6	2	2	2	2	2	2	2
Upper Chinook	92	39	53	2	2	2	2	2	2	2	2	2
Upper Chinook-Chehalis	9	3	6	2	2	2	2	2	2	2	2	2
Upper Chinook-Chehalis-Quinalt	3	1	2	3	3	3	3	3	3	3	3	3
Upper Chinook-Cowlitz	22	10	12	3	3	3	3	3	3	3	3	3
Stokomish Reservation	189	94	95	163	85	78	4	1	3	22	8	14
Clallam	1	1	1	1	1	1	1	1	1	1	1	1
Skokomish	188	93	95	162	84	78	4	1	3	22	8	14
Squaxin Island Reservation (Squaxin)	39	20	29	29	15	14	1	1	3	9	4	5
Tulalip Agency	3,500	1,766	1,734	2,068	1,040	1,028	12	3	9	1,420	723	697
Lummi Reservation	667	340	327	548	271	246	263	509	271	119	63	56
Lummi	628	326	302	509	263	246	263	509	271	119	63	56
Lummi-Chippewa	8	4	4	8	4	4	4	4	4	4	4	4
Lummi-Clallam	6	1	5	6	1	5	1	1	1	1	1	1
Lummi-Colville	1	1	1	1	1	1	1	1	1	1	1	1
Lummi-Nez Perce	3	3	3	3	3	3	3	3	3	3	3	3
Lummi-Snohomish	12	2	10	12	2	10	2	2	2	2	2	2
Lummi-Swinomish	6	3	3	6	3	3	3	3	3	3	3	3
Lummi-Yakima	2	1	1	2	1	1	1	1	1	1	1	1
Snohomish	1	1	1	1	1	1	1	1	1	1	1	1
Muckleshoot Reservation	200	89	111	191	85	106	3	1	2	6	3	3

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Washington—Continued.												
Tulalip Agency—Continued.												
Port Madison Reservation												
Suquamish	171	86	85	155	81	74	3		3	13	5	8
Suquamish-Clallam	148	77	71	132	72	60	3		3	13	5	8
Suquamish-Puyallup	4	1	3	4	1	3						
Suquamish-Snohomish	17	7	10	17	7	10						
Suquamish-Snohomish	2	1	1	2	1	1						
Puyallup Reservation	323	162	166	29	15	14				299	147	152
Puyallup	301	148	153	24	13	11				277	135	142
Puyallup-Cowlitz	1									1		1
Puyallup-Muckleshoot	8	4	4							8	4	4
Puyallup-Quinalt	1	1	1							1	1	1
Puyallup-Skokomish	3	2	2							3	2	1
Puyallup-Snohomish	5	2	3		2	3				3	2	1
Puyallup-Suquamish	3	1	2	5						3		2
Puyallup-Yakima	6	4	2							6	4	2
Swinomish Reservation	273	130	143	268	127	141				5	3	2
Muckleshoot	1			1						1		
Suquamish	1		1									
Swinomish	246	119	127	241	116	125				5	3	2
Swinomish-Clallam	2			2								
Swinomish-Lummi	4	1	3	4	1	3						
Swinomish-Muckleshoot	3	1	2	3	1	2						
Swinomish-Skagit	2		2	2		2						
Swinomish-Suquamish	4	4		4	4							
Swinomish-Suquamish-Muckleshoot	7	3	4	7	3	4						
Swinomish-Upper Chinook	3	2	1	3	2	1						
Tulalip Reservation and Tulalip un-attached Indians	663	322	341	457	223	234	2		2	204	99	105
Clallam	4	3	1	4	3	1						
Skagit	2	1	1	2	1	1						
Snohomish	556	273	283	368	184	184	1		1	187	89	98
Snohomish-Clallam	21	9	12	15	5	10				6	4	2
Snohomish-Lummi	3	3								3	3	
Snohomish-Makah	1		1				1		1			
Snohomish-Nooksack	2	2		2	2							
Snohomish-Palife	1	1		1	1							
Snohomish-Puyallup	6	2	4	6	2	4						
Snohomish-Puyallup-Suquamish	3	1	2	3	1	2						
Snohomish-Skagit	14	6	8	11	5	6				3	1	2
Snohomish-Skokomish	5	1	4	5	1	4				5	1	4
Snohomish-Suquamish	17	8	9	12	6	6				5	2	3

[illegible]

For footnotes see p. 155.

Table 2.—Indian Population in Continental United States Enumerated at Federal Agencies According to Tribe, Sex, and Residence, April 1, 1934—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Wisconsin—Continued.												
Kashena Agency—Continued.												
Oneida Reservation—Continued.												
Oneida-Pueblo.....	4	3	1				3	1	2	4	3	1
Oneida-Sioux.....	3	1	2									
Oneida-Stockbridge.....	36	12	24	36	12	24						
Oneida-Wyandotte.....	13	7	6				11	7	4	2		2
Lac du Flambeau Agency¹⁵.....	4,652	2,346	2,306	3,750	1,880	1,870	73	44	29	829	422	407
Bad River Reservation (Chippewa).....	1,211	629	582	732	385	347	24	15	9	455	229	226
Lac Courte Oreille Reservation (Chippewa)¹⁶.....	1,559	769	790	1,425	697	728	28	14	14	106	58	48
Lac du Flambeau Reservation (Chippewa).....	853	401	452	741	347	394				112	54	58
Red Cliff Reservation (Chippewa).....	606	318	288	452	237	215	6	4	2	148	77	71
Scattered bands.....	423	229	194	400	214	186	15	11	4	8	4	4
Potawatomi.....	388	217	171	365	202	163	15	11	4	8	4	4
Potawatomi-Chippewa.....	2	2	2	2	2	2						
Potawatomi-Menominee.....	2	2	8	10	2	8						
Potawatomi-Ottawa.....	10	6	4	10	6	4						
Potawatomi-Winnebago.....	13	4	9	13	4	9						
Tomah School Jurisdiction and Public Domain Allotments (Winnebago).....	1,408	691	717	1,191	559	602	137	59	78	80	43	37
Wyoming	2,178	1,116	1,062	1,948	1,010	938	52	27	25	178	79	99
Shoshone Agency and Wind River or Shoshone Reservation.....	2,178	1,116	1,062	1,948	1,010	938	52	27	25	178	79	99
Arapaho.....	1,056	546	510	1,021	530	491	14	8	6	21	8	13
Arapaho-Gros Ventre.....	9	4	5	9	4	5						
Arapaho-Shoshone.....	4	2	2									
Arapaho-Sioux.....	3	1	2	3	1	2				4	2	2
Shoshone.....	1,049	529	520	882	456	426	33	16	17	134	57	77
Shoshone-Arapaho.....	10	6	4	7	4	3	1	1	1	2	1	1
Shoshone-Bannock.....	8	6	2	7	5	2						
Shoshone-Cherokee.....	1		1	1		1						
Shoshone-Comanche.....	1		1									
Shoshone-Flathead.....	3	2	1				2	1	1	3	2	1
Shoshone-Klamath.....	6	2	4	4	1	3						
Shoshone-Navajo.....	7		1	1			1		1	7	4	3
Shoshone-Paiute.....	1	4	3								3	1
Shoshone-Seminole-Wyandotte.....	4	3	1	3	4	1				4	3	1
	3	2	1		2	1						

Shoshone-Ute.....	10	7	3	10	7	3	3	2	1
Shoshone-Ute-Paite.....	1	2	1	1	1	1	1	1	1
Shoshone-Yakima.....	3		1						

¹ See estimated statement of other Indians not enumerated, numbering 93,166.

² Formerly the entire population of Western Navajo Reservation was reported under Arizona; hence, the decrease in the population of that reservation in Arizona. The portion of the reservation lying in Utah is now shown under Utah.

³ Formerly Fort McDowell and Salt River Reservations were under the jurisdiction of Phoenix School, but now under Pima; hence, the marked change in population.

⁴ Formerly Gila Bend Reservation was under Pima Agency; but now under Sells Agency; hence, the unusual increase in Sells Agency.

⁵ 177 Indians on Chul Chuischu Reservation, Pima Agency, transferred to Papago Reservation, Sells Agency.

⁶ Apr. 1, 1933, population.

⁷ Formerly Havasupai Reservation was a separate jurisdiction, but now under Truxton Canon Agency.

⁸ Tulare County Indians prior to 1922 returned under Tule River Reservation.

⁹ Apr. 1, 1930, population.

¹⁰ Nez Perce Reservation formerly under Fort Lapwai Agency, but now under Coeur d'Alene Agency. Fort Lapwai Agency has been abolished.

¹¹ Formerly Ponca and Santee Reservations, Nebr. and Yankton Reservation, S. Dak., were under the jurisdiction of Yankton Agency, S. Dak. That agency has been abolished.

¹² The two former reservations placed under the jurisdiction of Winnebago Agency and the latter under Rosebud Agency.

¹³ Pyramid Lake Reservation formerly a separate jurisdiction; but now under Carson School Jurisdiction; hence the unusual increase.

¹⁴ 292 Indians under Southern Navajo Agency, N. Mex. transferred to Eastern Navajo Agency, N. Mex.

¹⁵ Makah and Orette Reservations formerly under Neah Bay Agency, but now under Taholah Agency. Neah Bay Agency has been abolished.

¹⁶ Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Lac du Flambeau Agency. (See estimated statement.)

¹⁷ Lac Courte Oreille Reservation formerly under Hayward School Jurisdiction, but now under Lac du Flambeau Agency. Hayward School Jurisdiction has been abolished.

Table 3.—Indian School Population and School Enrollment During Fiscal Year Ended June 30, 1934

NOTE.—A LARGE NUMBER OF THE INDIAN CHILDREN REPORTED IN COLUMN 11 ARE BELIEVED TO BE IN PUBLIC SCHOOLS AWAY FROM RESERVATIONS. COLUMN 12 INCLUDES INELIGIBLES

The total scholastic population of the Five Civilized Tribes is taken from the State enumeration and is not inclusive of all Indian children of the Five Civilized Tribes. The enrollment figures include children who are under 6 and over 18 years of age. The Indian pupils for the Five Tribes reported as in public schools include only those for whom tuition was paid, and do not include children enrolled in public schools in incorporated towns; these children are shown under column 11.

State and jurisdiction	Indian children 6 to 18, inclusive	Enrollment								Definite information not available	Not enrolled in any school	Under 6 and over 18, enrolled in all schools
		Total number	Local public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatoria			
1	2	3	4	5	6	7	8	9	10	11	12	13
Total	102,440	76,264	45,678	7,474	9,167	5,429	1,986	6,117	413	11,553	14,623	5,335
Arizona	14,507	8,102	621	2,333	2,057	1,331	792	939	29	1,518	4,887	1,204
Colorado River:												
Chemehuevi	76	72	50	1	13	7			1		4	
Mohave	206	182	100	45	12	18		5	2	15	9	13
Fort Apache	838	706	21	89	415	1	130	49	1		132	90
Hopi:												
Hopi	775	732	43	483	3	209		14			23	486
Navajo	1,069	301	4		206	86		5		378	390	174
Kaibab (under Paiute)	24	19		12		5				1	4	
Leupp	728	324	13		287	24				7	397	36
Phoenix: Camp Verde	108	69	40		3	26				2		2
Pima	1,667	1,183	27	688		182	141	145		484		85
Salt River	412	329	37	190		88		14			83	
San Carlos	748	529	18	235	64	8	157	41	6	11	208	27
Sells	1,601	1,018	56	311		124	364	163		583	54	54
Southern Navajo	4,422	1,922	200	140	700	386		502	12		2,500	181
Truxton Canon.												
Havasupai	53	52		37		15					1	1
Unalakapi	130	120		26		94					10	4
Western Navajo:												
Hopi	105	105	5	76		24						
Navajo	1,545	419			354	24						
California	4,937	4,453	3,506	225	685	638	2	77	5	147	1,337	1,937
Bishop (under Walker River Nev.)	449	346	279	7		58		2		75	28	17
Fort Yuma	189	175	26	113		35			1	14	17	18
Hoop Valley	1,221	1,131	907	77		141	2		4	3	87	

California

Mission	740	654	513	88	53	69	86
Sacramento	2,338	2,147	1,781	316	22		1,922
Colorado: Consolidated Ute	215	184	70	15	2		31
Florida: Seminole	180	16					13
Idaho	1,063	895	505	23	133		80
Coeur d'Alene	221	208	122	5	77	52	19
Nez Perce	370	322	236	3	36	47	41
Fort Hall	472	365	147	15	20		20
Iowa: Sac and Fox	118	99	35	48	7	12	7
Kansas	573	467	397	70	45	45	478
Sac and Fox	20	18	17	1	1	1	1
Potawatomi	248	187	133	54		26	35
Lowa	183	166	158	8		17	232
Kickapoo	122	96	89	7			114
Minnesota	4,586	3,984	2,725	511	338	18	8
Consolidated Chippewa	3,816	3,322	2,522	425	227	405	250
Pipestone	82	80	64	14	2	336	158
Red Lake	691	532	139	72	111	69	2
Mississippi: Choctaw	354	372	372				90
Montana	4,787	4,210	3,771	140	266	25	12
Blackfeet	1,271	1,048	739	30	47	14	472
Crow	620	564	527	11	6	2	223
Flathead	978	829	634	18	103		56
Fort Belknap	436	405	253	36	49		32
Fort Peck	826	809	730	7	57		2
Rocky Boys	243	217	9	22	10	29	16
Tongue River	413	338	112	20	6	25	1
Nebraska	1,535	1,372	1,152	7	86	1	6
Winnebago	431	394	324	48	172	40	163
Omaha	579	511	437	20	50		37
Santee	378	339	279	22	52		68
Ponca	128	112	112	1	59		39
Nevada	1,338	1,015	441	5	11		19
Carson	545	432	278	278	1	24	199
Pyramid Lake	125	102	19	113	45		45
Moapa River (under Paiute, Utah)	41	34	22	16	9		2
Walker River				12		3	
Fallon	110	88	21	31			22
Walker River	117	87	6	34			30
Mason-Smith Valleys	110	57	18	34	1	8	45
Scattered Indians	97	72	62	10			25
Western Shoshone	183	143	115	28		13	143
New Mexico	9,304	4,797	143	751	494	135	334
Eastern Navajo	2,812	894	42	107	139	24	4,483
Jicarilla	200	187	14	9	93	71	1,918
Mescalero	195	134	5	14	2	3	1
Northern Navajo	3,172	1,063	21	130	38		61
Northern Pueblos			4	134	52		2,109
					6		57

1 All pupils above third grade attend public school.
 2 149 of these children were housed in the dormitory.

	7,998	6,472	2,414	931	1,136	650	88	1,230	23	392	1,134	282
South Dakota	899	832	378	75	236	74		69		11	56	
Cheyenne River												
Crow Creek												
Crow Creek	247	221	113		4	36		68		16	10	21
Lower Brule	204	186	82		25	23		56		6	12	7
Flandreau	100	82	48			30	3			9	9	12
Pine Ridge	2,450	2,050	544	622	450	24	25	382	3	17	383	110
Rosebud	1,949	1,523	469	231	270	104	22	425	2	12	414	77
Yankton	1,747	1,463	241	3	16	95	38	68	2	243	41	
Sisseton	795	663	303			234		115	9	14	118	34
Standing Rock	607	452	234		135	30		46	7	64	91	21
Utah	408	377	154	105	64	53		1		17	74	2
Uintah and Ouray	358	300	134	70	60	35		1		10	48	
Paute												
Goshute	34	32		29		3					2	
Shivwits	24	21	8			13				1	2	1
Skull Valley	12	8		6		2				2	2	
Scattered Bands	27	9	9							4	14	1
Allen Canyon (under Consolidated Ute)	13	3	3		4						6	
Washington	3,439	2,810	2,458		8	83	1	171	89	354	275	42
Colville												
Colville	918	768	653			8		105	2	92	58	6
Spokane	269	245	227					12	6	3	21	
Taholah	507	433	402			8		6	17	11	63	9
Neah Bay	116	99	85			8	1		5	6	11	2
Tulalip	1,049	854	753			33		9	59	78	117	
Yakima	580	411	338		8	26		39		164	5	25
Wisconsin	2,305	1,811	613	136	3	122	401	529	7	319	175	57
Hayward	2,418	1,368	232	3		28	78	26	1	26	24	11
Keshena						4	118	363	3	1	18	24
Lac du Flambeau	563	544	33	21								
Lac du Flambeau												
Lac du Flambeau	236	192	47	111		27		7		9	35	8
Red Cliff	157	97	12	1		8	75	1		47	13	
Crandon	159	92	77		3			4		67		
Bad River	336	199	40			18	130			109	28	5
Tomah	436	319	170			29		119	1	60	57	9
Wyoming	673	545	147	120		13		265		68	60	13
Shoshone												
Shoshone	332	266	118	112		9		27		39	27	6
Arapaho	341	279	29	8		4		238		29	33	7

3 107 of these children attend public school.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Total	25,639	21,516		
Arizona:				
Colorado River Agency:				
Colorado River.....	46	41	B-5	Day.
Fort Apache Agency:				
Fort Apache.....	376	368	2-10	Reservation, boarding.
Cibicue.....	54	46	B-3	Day.
Theodore Roosevelt.....	140	136	B-4	Nonreservation, boarding.
Hopi Agency:				
Hopi.....	176	73	B-7	Reservation, boarding.
Chimopovy.....	71	65	B-7	Day.
Hotevilla-Bacabi.....	124	116	B-8	Do.
Oraibi.....	78	169	B-7	Do.
Polacca.....	146	123	B-8	Do.
Second Mesa.....	73	60	B-7	Do.
Leupp Agency:				
Leupp.....	377	292	B-9	Reservation, boarding.
Phoenix School:				
Phoenix.....	641	572	7-12	Nonreservation, boarding.
Pima:				
Pima.....	314	257	B-9	Day.
Blackwater.....	43	33	B-2	Do.
Casa Blanca.....	122	106	B-5	Do.
Gila Crossing.....	60	56	B-5	Do.
Lehi.....	35	30	B-4	Do.
Maricopa.....	34	31	B-4	Do.
Salt River.....	155	133	B-6	Do.
Santan.....	124	109	B-4	Do.
San Carlos Agency:				
San Carlos.....	134	94	B-8	Reservation, boarding.
San Carlos.....	269	212	B-8	Day.
Sells Agency:				
Chui Chuschu.....	26	13	B-4	Do.
Poso Redondo.....	37	15	B-5	Do.
Santa Rosa.....	146	109	B-4	Do.
Sells-Vamori.....	105	79	B-6	Do.
Ventena.....	56	41	B-4	Do.
Southern Navajo Agency:				
Chin Lee.....	136	133	B-4	Reservation, boarding.
Southern Navajo.....	391	351	B-6	Do.
Tolatchi.....	210	202	B-6	Do.
Cornfields.....	38	37	B-4	Day.
Crystal.....	34	31	1-3	Do.
Kinlichee.....	35	34	B-2	Do.
Kloutah.....	33	31	1	Do.
Truxton Cañon School:				
Truxton Cañon.....	232	204	B-8	Reservation, boarding.
Havasupai.....	41	37	B-6	Day.
Peach Springs.....	26	25	B-6	Do.
Western Navajo Agency:				
Western Navajo.....	354	348	B-7	Reservation, boarding.
Moencopi.....	78	75	B-6	Day.
California:				
Fort Yuma Agency:				
Fort Yuma.....	156	113	B-6	Do.
Hoopa Valley Agency:				
Hoopa Valley.....	105	83	B-5	Do.
Sacramento Agency:				
Fort Bidwell.....	28	21	B-6	Do.
Sherman Institute	852	733	7-12	Nonreservation, boarding.
Colorado:				
Consolidated Ute Agency:				
Ignacio.....	226	214	B-8	Reservation, boarding.
Ute Mountain.....	169	156	B-7	Do.
Florida:				
Seminole Agency:				
Seminole.....	29	9	B-3	Day.
Idaho:				
Fort Hall Agency:				
Fort Hall.....	230	192	B-8	Reservation, boarding.
Iowa:				
Sac and Fox Agency:				
Mesquakie.....	49	37	B-3	Day.
Kansas:				
Haskell Agency:				
Haskell Institute.....	799	617	10-12	Nonreservation, boarding.
Kickapoo.....	23	22	B-6	Day.
Michigan:				
Mount Pleasant School	52	45	2-9	Nonreservation, boarding.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Minnesota:				
Consolidated Chippewa Agency:				
Pine Point.....	85	72	B-6	Day.
Pipestone School.....	308	302	B-9	Nonreservation, boarding.
Red Lake Agency:				
Cross Lake.....	103	100	B-7	Reservation, boarding.
Red Lake.....	130	105	B-9	Do.
Mississippi:				
Choctaw Agency:				
Bogue Chitto.....	39	30	B-3	Day. ¹
Bogue Homo.....	20	16	B-6	Do. ¹
Conehatta.....	59	47	B-5	Do. ¹
Pearl River.....	84	74	B-7	Do. ¹
Red Water.....	57	47	B-6	Do. ¹
Standing Pine.....	32	29	B-6	Do. ¹
Tucker.....	62	57	B-6	Do. ¹
Montana:				
Blackfeet Agency:				
Blackfeet.....	178	139	1-12	Reservation, boarding.
Heart Butte.....	60	28	B-3	Day.
Fort Belknap Agency:				
Fort Belknap.....	88	69	1-11	Reservation, boarding.
Fort Peck Agency:				
Fort Peck.....	149	115	B-12	Do.
Rocky Boys' Agency:				
Forest Camp.....	27	17	B-5	Day.
Haystack Butte.....	33	27	B-5	Do.
Parker Canyon.....	33	20	B-8	Do.
Rocky Boys'.....	52	36	B-7	Do.
Sangrey.....	37	26	B-7	Do.
Tongue River Agency:				
Tongue River.....	96	86	B-8	Reservation, boarding.
Birney.....	40	35	B-6	Day.
Muddy Creek.....	6	5	B-8	Do.
Nebraska:				
Genoa School.....	70	55	B-12	Nonreservation, boarding.
Nevada:				
Carson Agency:				
Carson.....	607	545	B-10	Do.
Fort McDermitt.....	40	35	B-6	Day.
Nevada.....	81	66	B-7	Do.
Walker River Agency:				
Fallon.....	38	28	B-3	Do.
Walker River.....	68	50	B-8	Do.
New Mexico:				
Albuquerque School.....	778	723	7-12	Nonreservation, boarding.
Charles H. Burke School.....	501	433	4-12	Do.
Eastern Navajo Agency:				
Eastern Navajo (Pueblo Bonito).....	360	351	B-6	Reservation, boarding.
Pinedale.....	23	22	B-3	Day.
Mescalero Agency:				
Mescalero.....	124	116	B-6	Reservation, boarding.
Northern Navajo Agency:				
San Juan.....	409	401	B-8	Do.
Toadlena.....	245	215	B-7	Do.
Nava.....	60	52	B-5	Day.
Redrock.....	56	29	B-3	Do.
Sanostee.....	65	58	B-2	Do. ¹
Tecnospos.....	27	16	B	Do.
Santa Fe Agency:				
Santa Fe.....	530	467	3-12	Nonreservation, boarding.
Nambe.....	20	19	B-2	Day.
Picuris.....	28	24	B-4	Do.
San Ildefonso.....	20	17	B-5	Do.
San Juan.....	92	88	B-7	Do.
Santa Clara.....	69	62	B-6	Do.
Taos.....	176	171	B-8	Do.
Tesuque.....	21	13	B-5	Do.
Southern Pueblos Agency:				
Acomita.....	101	86	B-6	Do.
Chicale.....	20	23	B-6	Do.
Cochiti.....	45	43	B-6	Do.
Encinal.....	17	13	B-6	Do.
Isleta.....	116	100	B-6	Do.
Jemez Mission.....	32	30	1-2	Do.
Jemez.....	53	49	B-6	Do.
Laguna.....	50	47	B-6	Do.
McCartys.....	67	60	B-6	Do.
Mesita.....	19	16	B-5	Do.

¹ Figures taken from report for Dec. 30.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Southern Pueblo Agencies—Continued.				
Paguatae.....	66	56	B-6	Day.
Paraje.....	40	37	B-6	Do.
Sandia.....	20	19	B-5	Do.
San Felipe.....	59	50	B-5	Do.
Santa Ana.....	29	26	B-7	Do.
Santa Domingo.....	113	99	B-6	Do.
Seama.....	26	24	B-6	Do.
Sia.....	21	20	B-5	Do.
Zuni Agency:				
Zuni.....	143	127	B-9	Do.
North Carolina:				
Cherokee Agency:				
Cherokee.....	316	286	B-10	Reservation, boarding.
Cherokee.....	90	72	B-8	Day.
Big Cove.....	33	26	B-5	Do.
Birdtown.....	63	48	B-5	Do.
North Dakota:				
Bismarck School.....	114	83	4-10	Nonreservation, boarding.
Fort Berthold Agency:				
Independence.....	31	20	B-7	Day.
Nishu.....	28	17	B-7	Do.
Shell Creek.....	49	31	B-6	Do.
Fort Totten School.....	228	195	1-9	Reservation, boarding.
Standing Rock Agency:				
Standing Rock.....	229	197	B-8	Do.
Turtle Mountain Agency:				
Turtle Mountain.....	727	423	1-8	Day.
Indian Day No. 5.....	87	52	1-6	Do.
Roussin.....	66	48	B-4	Do.
Wahpeton School.....	364	345	B-9	Nonreservation, boarding.
Oklahoma:				
Cheyenne and Arapaho Agency:				
Cheyenne and Arapaho.....	241	114	1-9	Reservation, boarding.
Chillico School.....	841	670	7-12	Nonreservation, boarding.
Kiowa Agency:				
Fort Sill.....	211	183	1-9	Reservation, boarding.
Riverside.....	240	215	B-8	Do.
Pawnee Agency:				
Pawnee.....	260	213	1-8	Do.
Quapaw Agency:				
Seneca.....	274	259	1-9	Do.
Five Civilized Tribes Agency:				
Sequoyah Orphan Training School.....	365	339	1-12	Nonreservation, boarding.
Creek Nation:				
Euchee.....	131	111	1-9	Do.
Eufaula.....	155	149	B-9	Do.
Chickasaw Nation:				
Carter Seminary.....	190	159	1-9	Do.
Choctaw Nation:				
Jones Male Academy.....	213	178	B-9	Do.
Wheelock Academy.....	138	132	B-9	Do.
Oregon:				
Salem School.....	360	286	7-12	Do.
Warm Springs Agency:				
Warm Springs.....	147	136	B-8	Reservation, boarding.
South Dakota:				
Cheyenne River Agency:				
Cheyenne River.....	275	232	B-9	Do.
Cherry Creek.....	29	21	1-6	Day.
Green Grass.....	29	18	B-6	Do.
Thunder Butte.....	20	17	B-5	Do.
Flandreau School.....	504	452	10-12	Nonreservation, boarding.
Pierre School.....	325	290	B-10	Do.
Pine Ridge Agency:				
Pine Ridge (Oglala).....	610	440	B-12	Reservation, boarding.
No. 4.....	25	19	B-6	Day.
No. 5.....	50	42	B-6	Do.
No. 6.....	28	16	1-5	Do.
No. 7.....	30	19	B-6	Do.
No. 9.....	39	22	B-6	Do.
No. 10.....	27	14	B-6	Do.
No. 12.....	16	11	B-5	Do.
No. 15.....	20	17	B-5	Do.
No. 16.....	39	26	B-6	Do.
No. 17.....	15	10	2-6	Do.
No. 20.....	27	21	B-6	Do.
No. 21.....	23	13	B-5	Do.
No. 22.....	27	18	B-6	Do.

Table 4.—Indian Schools, Classification and Statistics for Fiscal Year Ended June 30, 1934—Con.

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
South Dakota—Continued.				
Pine Ridge Agency—Continued.				
No. 23.....	21	15	B-6	Day
No. 24.....	48	30	B-6	Do.
No. 25.....	21	15	B-6	Do.
No. 26.....	15	8	B-6	Do.
No. 27.....	28	20	B-6	Do.
No. 28.....	12	7	B-6	Do.
Red Shirt Table.....	19	11	B-6	Do.
Kyle.....	134	89	B-8	Do.
Wakpamni Lake.....	17	12	B-6	Do.
Rapid City School	58	57		Nonreservation boarding.
Rosebud Agency:				
Rosebud.....	320	213	B-9	Reservation, boarding.
Blackpipe.....	32	18	B-5	Day.
Cut Meat.....	38	23	B-6	Do.
He Dog's Camp.....	28	25	B-6	Do.
Little Crow.....	31	27	B-6	Do.
Milk's Camp.....	30	21	B-6	Do.
Oak Creek.....	22	17	B-6	Do.
Spring Creek.....	34	22	B-6	Do.
Upper Cut Meat.....	17	12	1-6	Do.
Utah:				
Paiute Agency:				
Goshute.....	44	36	B-8	Do.
Kaibab.....	17	13	B-6	Do.
Uintah and Ouray Agency:				
Uintah.....	112	74	B-7	Reservation, boarding.
Uintah.....	44	19	B-7	Day.
Ouray.....	37	21	B-5	Do.
Wisconsin:				
Hayward School	45	30	1-9	Reservation, boarding.
Keshena Agency:				
Neopit.....	29	20	B-8	Day.
Lac du Flambeau Agency:				
Lac du Flambeau.....	142	109	1-9	Do.
Tomah School	240	190	1-10	Nonreservation, boarding.
Wyoming:				
Shoshone Agency:				
Shoshone.....	139	116	B-10	Day.

SCHOOL SUMMARY

Class	Number of schools	Enrollment	Average attendance
Nonreservation, boarding.....	25	9,276	8,069
Reservation, boarding.....	36	8,401	7,211
Day.....	134	8,063	6,288
Total	195	25,740	21,568

THE NATIONAL PARK SERVICE

ARNO B. CAMERER, Director

This year, for the first time in its history, the National Park Service goes on a fiscal-year basis in its annual report. Previously these reports covered primarily a seasonal year beginning October 1 and ending the following September 30, although of necessity financial matters were reported on a fiscal-year basis.

In making the transition, this report for 1934 covers financial matters for the entire fiscal year ended June 30, but construction, travel, and other activities previously covered on a travel-year basis, herein are reported for the period from October 1, 1933, to June 30, 1934, to avoid duplication of material in last year's report. The annual report of the National Park Service will be entirely on a fiscal-year basis.

The Federal campaign to make 1934 outstanding as a national-park year met with an enthusiastic response, with the result that travel to the scenic national parks increased 38 percent for the period October 1, 1933, to June 30, 1934, over the same period a year ago.

Following the Secretary's appeal to the American people last January to visit their national parks during 1934, the National Park Service entered into an intensive travel-promotion campaign. Although handicapped by the fact that no funds were available for advertising, and with printing funds so limited as to make impossible the issuance of an adequate quantity of printed informational matter, this campaign was a distinct success. This happy result was achieved through the whole-hearted cooperation of the operators of concessions in the national parks, railroads and other transportation systems, automobile associations, oil companies, chambers of commerce, civic organizations, and conservationists generally. The press supported the movement universally, and radio companies were exceedingly generous in donating free time for national-park broadcasts. Valuable assistance also was given whenever possible and consistent by various Federal emergency organizations.

Among the extraordinary activities of the National Park Service in promoting park travel in 1934 were the promotion of two national-park radio series and related talks; the sponsoring of a series of national-park stamps; the preparation of six national-park posters,

the first to be issued by the Department of the Interior; the issuance of thoroughly revamped information circulars; cooperation with emergency relief agencies in public works; and cooperation with outside agencies whereby much material was furnished for use in newspaper and magazine advertising.

In all of the above, and particularly in pushing the national-park stamp series project, the support and active cooperation of the Secretary of the Interior has been invaluable.

NATIONAL PARKS PARTICIPATION IN EMERGENCY ACTIVITIES

The National Park Service was fortunate in being one of those bureaus so situated that it was able, with a minimum of time, to enter actively into the various emergency measures destined by the President to bring relief to the country.

It administers large areas of publicly owned lands where protective measures of various types are needed; it annually entertains several millions of people recreation-bent and many long-desired improvements for their comfort needed to be installed; it possessed the administrative, scientific, and technical nucleus capable of quick expansion in handling relief measures; and it already had plans for long-time development needs on which to base sound improvement and constructive activities under the emergency measures.

With this background it was able to get the most from every dollar and every man available for national-park work under Public Works, Civil Works, and Emergency Conservation Work. All of these activities resulted in immeasurable good through conservation of priceless national and natural resources and in great economic good to neighboring vicinities, most of them off the beaten track of commercial development and presenting serious pictures of privation and actual want.

Through Public Works activities, still in progress, construction programs of great importance were made possible; through emergency conservation protection to the forests against fire, flood, and insect attacks was provided; and Civil Works filled in the gap between these two in a most valuable way. I cannot speak too strongly of the good work accomplished under all three agencies. Through them the National Park Service and the public visiting the park and monument areas have benefited immeasurably.

THE CIVIL WORKS PROGRAM

The Civil Works program for the National Park Service began on November 28, 1933, and was terminated April 28, 1934. At the peak of the program there was a total of 12,942 men and 192 women employed. The total expenditure amounted to \$2,490,678, of which

\$1,988,960 was for labor. The National Park Service program was divided into three main divisions, namely, Historical American Building Survey, National Capital Parks Project, and the National Parks and Monuments Project. The National Parks and Monuments Project included 72 national parks and monuments located in 27 States and the Territory of Hawaii.

The following outstanding projects were accomplished under Civil Works Administration grants:

HISTORICAL AMERICAN BUILDING SURVEY PROJECT

Employment of approximately 700 architects and draftsmen who collected data and made architectural drawings for historical purposes of some 860 buildings throughout the United States.

NATIONAL CAPITAL PARKS PROJECT

Employment of approximately 1,500 workers, who built swimming pools, landscaped park areas, improved roads and paths, planted trees and shrubs, and made other valuable improvements for the enjoyment of the people in the parks of the District of Columbia.

NATIONAL PARKS AND MONUMENTS PROJECT

Employment of some 11,000 workers for various types of work on the projects in the national parks and monuments, as follows:

Museum laboratory (western field headquarters).—Employment of artists, painters, sculptors, draftsmen, engineers, etc., in the preparation of numerous museum displays for the museums of the various national parks and monuments.

Archeological research and development of southwestern monuments.—Employment of some 600 workers, including Indians, cowboys, homesteaders, and trained archeologists, who accomplished excellent results in building roads and other badly needed improvements, as well as making valuable archeological studies in 15 national monuments in Arizona and New Mexico.

Glacier National Park.—Removal of 45 carloads of fire-killed timber, which was shipped to the Blackfeet Indian Reservation in Montana, to be used by the Indians for fuel and building purposes.

Historical parks and monuments in the East.—Valuable historical projects for collection of authentic historical data, and development of historical areas.

Other accomplishments.—Thousands of acres of fire-hazard reduction, many acres of erosion control, including construction of many check dams, reforestation and sodding, many miles of roadside beautification, construction of many foot and motor vehicle bridges, remodeling old buildings, preservation of historic and prehistoric areas and historically important structures, construction of roads,

trails, telephone lines, water and sewer systems, lighting facilities, camp-ground facilities, such as tables and fireplaces.

A large amount of important work that could not have been accomplished otherwise because of insufficient appropriations was accomplished in the various national parks and monuments through the medium of the Civil Works Administration, and the character of the work done by the Civil Works Administration employees in most cases was excellent. This, combined with the much needed relief which was provided to thousands of practically destitute people residing near the various parks and monuments, definitely establishes the Civil Works program as a successful enterprise in the national parks and monuments.

EMERGENCY CONSERVATION WORK

The National Park Service has benefited greatly from its opportunity to participate in the President's Emergency Conservation Work program. The establishment of Civilian Conservation Corps camps within the national parks and monuments has resulted in accomplishing work that had been greatly needed for years, but which was impossible and doubtless would have remained impossible of accomplishment under normal appropriations for many years. But the accomplishments must not be measured only in terms of the practical achievements of this nature, but also must take into account the remarkable rehabilitation of the young men, literally remaking them, changing their psychological aspect, and restoring them with healthy minds and bodies to normal industrial activities.

Following the resignation of former Director Horace M. Albright the present Director of the National Park Service has served as the Interior Department representative on the Advisory Council to Robert Fechner, Director of Emergency Conservation Work, and the Associate Director has served as alternate. Chief Forester J. D. Coffman has acted as liaison officer for the various bureaus of the Department of the Interior and has supervised the program for the national parks and monuments. Assistant Director Conrad L. Wirth, Chief of the Branch of Planning, has directed the Emergency Conservation Work in the State parks and related areas.

All work within areas under the jurisdiction of the National Park Service has been carefully planned by experienced landscape architects, engineers, foresters, and wildlife experts so as to preserve the distinct natural features, and in addition in the historical and military parks, historical technicians have been employed to insure the careful preservation and interpretation of the historical values.

A particularly happy feature of participation in the Civilian Conservation Corps activities by the National Park Service was the opportunity it afforded the Bureau to cooperate in an official way

with the State park agencies. It also made possible, on a slightly more limited scale, cooperation with a number of county and municipal park agencies which possess parks of a character similar to State parks.

The National Park Service is proud of the record that has been made in this new field. Its work has consisted of a careful study, in advance of each period of operation, of hundreds of applications, each setting forth a complete program of work for a 200-man camp, as well as the funds needed for its accomplishment; assistance, extended directly by its staff of technically trained inspectors, in study and criticism of detailed plans; and close contact with the work as it was carried out, to see that it was done efficiently, in accordance with the approved program, and in consonance with standards comparable with those established by the National Park Service for the national parks and monuments.

There can be no doubt that the Emergency Conservation Work program has been to a very large degree responsible both for increased interest in all types of parks in which it is being carried on and for the tremendous increase in State park acreage. Much of this increase in State park lands has come through donations by private individuals or corporations, although a number of States have continued or resumed park-land purchases. In some instances county or city funds have been expended in the purchase of desirable park lands. In many cases, the comprehensive planning required by the Park Service as a basis for Emergency Conservation Work, has indicated serious deficiencies in a number of parks which have been remedied in one way or another.

Since inauguration of the work, Virginia, West Virginia, South Carolina, Mississippi, Oklahoma, Nevada, and New Mexico have entered the State park field. New Hampshire, New York, Georgia, Florida, Alabama, Tennessee, Kentucky, Ohio, Illinois, Minnesota, Iowa, Missouri, Arkansas, Texas, North Dakota, Washington, California, and perhaps others have acquired new parks. The total acreage added to these systems since April 1, 1933, comes close to the half million mark.

During the first Emergency Conservation Work enrollment period, April 1, 1933, to September 30, 1933, 70 camps were established in national parks and monuments and 105 in State, county, and metropolitan parks. In the second enrollment period, October 1, 1933, to March 31, 1934, 61 camps existed in national parks and monuments and 239 in 32 States in State park areas; while in the third enrollment period, April 1, 1934, to September 30, 1934, 102 camps were allotted to national parks and monuments, and 268 camps were assigned to State parks and related areas with the camps existing in 40 different States. Plans have been made for 79 camps in national parks and

monuments and for 293 camps in State parks and associated areas with camps in 41 States for the fourth enrollment period which will extend from October 1, 1934, to March 31, 1935. In addition, the extension of the drought-relief program has caused the allotment of 6 drought-relief Emergency Conservation Work camps to national parks and monuments and 52 such camps to State parks and associated areas for the year ending June 30, 1935. The Emergency Conservation Work program was extended to the Territory of Hawaii with 577 enrollees allotted to the Territorial portion and one 200-man camp to Hawaii National Park. Two regular fourth-period camps and one drought-relief camp, assigned to the Reclamation Service, will also be managed by this Service. There will be in the fourth period a total of 431 camps under the direct supervision of this office. Approximately 100,000 young men in all have been engaged in the work subject to the direction of the National Park Service with the employment of about 4,000 professionally and technically trained individuals to direct the work.

A statement of material accomplishments under the Emergency Conservation Work program in National, State, and allied areas under National Park Service supervision is given in table 9 on page 372.

PROGRESS UNDER REORGANIZATION

The last annual report made reference to plans then going forward under the President's Executive order of June 10, 1933, for the reorganization of all Federal park activities under the National Park Service.

During the current year substantial progress has been made in further realizing and organizing the new park system thus begun. Two units, having their principal activities in the District of Columbia, namely the branch of Public Buildings and the National Capital Parks, have been coordinated with the entire system to a degree that would have seemed impossible 12 months ago.

The new Superintendent of National Capital Parks was for some years at the head of Mesa Verde National Park, the most widely known of the areas in the Southwest set aside to preserve prehistoric American Indian life. He has brought to his new task a long experience with the problems of general park administration and a sympathy for the preservation of primitive and historical conditions and with their proper interpretation in the educational program. Landscape treatment, such as is in vogue in the entire National Park Service, as well as some nature guide and historical educational service have been introduced during the year in the National Capital Parks with most gratifying results and response from the public.

In the same way, the National Park Service has tended to stamp its essential character upon the newly acquired historical areas, many of which lie east of the Mississippi River.

The rise of historical parks and monuments in the last 12 months is perhaps the most significant single feature of National Park Service development. Four years ago this program did not exist, except for some incidental treatment of historical matters in certain of the western parks and monuments and in Acadia National Park in Maine. A year later Colonial and George Washington's Birthplace National Monuments in Virginia had entered the National Park Service family, destined to be the pioneer members of the now far-flung historical system. Another year passed and the Morristown National Historical Park idea had been born, to be realized on July 4, 1933, with the transfer of deeds from the donors of the land to the United States. Meanwhile Shenandoah National Park and Great Smoky Mountains National Park were authorized, each having large historical applications.

Then with Federal reorganization came the transfer of numerous historical areas, including Lincoln Birthplace in Kentucky; Fort McHenry in Baltimore Harbor, of Star-Spangled Banner fame; old Spanish Forts Marion and Matanzas at Saint Augustine, Fla., and Fort Pulaski at Savannah, Ga., as well as many nationally famous battlefield sites like Guilford Courthouse, Cowpens and King's Mountain in the Revolutionary period; and Antietam, Gettysburg, Shiloh, Vicksburg, Chickamauga, Kenesaw Mountain, Fredericksburg, Chancellorsville, Wilderness, Spotsylvania, Petersburg, and Appomattox of the Civil War era.

This list is only suggestive. The Statue of Liberty and the Wright Memorial, where the first successful flight by a heavier-than-air machine occurred, serve to illustrate, in contrast to the battlefield sites, the wide variety of historical areas and problems now being handled by the National Park Service.

Especially is this apparent if one remembers that to the dozen or so southwestern prehistoric parks and monuments have now been added half a dozen more heretofore controlled by the United States Forest Service and two midwestern mound areas at Shiloh National Military Park and at Mound City near Chillicothe, Ohio, formerly under the jurisdiction of the War Department. During the last session of Congress authority was given for adding to the national park and monument system the now famous Ocmulgee Fields near Macon, Ga., where some astonishing archeological evidence has recently been unearthed through scientists working under the auspices of the Smithsonian Institution and the National Park Service, which tends to prove the presence of a much earlier prehistoric life in the

Southeast than has heretofore been supposed, as well as its possible close connection to the southwestern cultures.

The ideal Federal program of historic sites preservation thus appears to be in a fair way of realization in this new unity of jurisdiction under the National Park Service. Already a basic philosophy has been evolved by which the different areas in the system are related to each other in definite fashion. Thus from the earliest prehistoric events of American life down to the time when the white man, after over three centuries spent in conquering American soil, conquered also the air, historic sites connected with various steps of this amazing drama of civilization will be preserved and used for the purpose of interpreting this engrossing story to those who visit these areas.

In the same way that the grand scenic areas of the West have been established as national parks and have gained a permanent place of undying affection in the hearts and minds of the American public, now the archeological and historical parks are rising to their rightful place in the genuine appreciation of the people. Not only do these areas typify the progressive story of American history, but also they represent much of the idealism and sacred tradition so dear to this Nation. For that reason their educational and intrinsic value in the Federal program of national parks and monuments is great.

NATIONAL PARK SERVICE PREPARING RECREATIONAL LAND-USE REPORT

By Executive order of June 30, 1934, the National Resources Board was established by the President "to prepare * * * a program and plan of procedure dealing with the physical, social, governmental, and economic aspects of public policy for the development and use of land, water, and other national resources * * *. The Board shall submit a report on land and water use on or before December 1, 1934, * * *."

To the National Park Service has been assigned the subject National and State Parks and Related Recreational Activities. To prepare this section of the National Resources Board report, the Recreation Division of the Board was set up in the Park Service with George M. Wright, Chief of the Wildlife Division, as its director, and Herbert Evison, Supervisor of State Park Emergency Conservation Work, as assistant director.

The main portion of the Recreation Division report is to be in the hands of the Board by October 1, but the preparation of supplemental material will probably continue a month or two longer.

Comprehensive information is being assembled regarding recreational facilities and recreational needs throughout the country, which should be invaluable in determining a broad recreational program for the United States.

SUBMARGINAL LAND ACQUISITION FOR RECREATIONAL USE

As a preliminary step to proper land utilization in the United States, \$25,000,000 was provided by the Federal Surplus Relief Corporation for acquiring lands of low production or lands not now in their proper use, described as submarginal lands, in an effort to reallocate these lands to proper usage. Of this amount, \$5,000,000 will be used for acquiring certain lands for recreational use, and the National Park Service was designated to develop this phase of the program. A general plan for carrying out this plan has been evolved and the work is proceeding satisfactorily. Three types of areas are being studied. The first and largest of these comprises a few well located regional recreational areas, consisting of from 10,000 to 15,000 acres that may be used by large numbers of visitors. The second type consists of smaller tracts of 1,500 to 2,000 acres in close proximity to the larger industrial centers for use by people of the lower income group and under-privileged children, for family camps, children-group camps, and organization camps. The third type is composed of tracts of 20 to 50 acres along well traveled highways that may be used as picnic areas by the traveler or family groups seeking a day's outing. These areas have been termed "waysides." Since the need of the last two types of areas is deemed most urgent, they are being given first consideration.

This program requires close cooperation with the Department of Agriculture and the Federal Emergency Relief Administration to determine what lands are submarginal and to solve the rehabilitation problems of persons occupying lands that are selected for purchase.

The selection of the areas, the obtaining of options and other pertinent data, the development of plans, the execution of such work as can be done by the Civilian Conservation Corps and the Federal Emergency Relief Corporation, and the making of agreements with the States and their political subdivisions regarding development, management, and maintenance of the areas are the direct responsibility of the National Park Service.

The recreational program will be an important factor in the social welfare of the country and will require cooperation with the States and their political subdivisions for some years to come. It is important that legislation be enacted that will make it possible to carry on the work beyond the 2-year emergency period.

*LEGISLATION URGED PROVIDING FEDERAL COOPERATION IN
STATE PARK DEVELOPMENT*

Recent activities of the Administration, particularly in emergency conservation work and new land utilization, have conclusively demonstrated the need of some form of cooperating agency between

State recreational units and the Federal Government. Since recreation is an important function of the National Park Service, as outlined in the enabling act of Congress, if such cooperation be extended it is desirable and logical that it be undertaken through the National Park Service.

The submarginal lands now being retired for recreational purposes in all probability eventually will come under some sort of State jurisdiction. This probability, coupled with the close relationship now existing between the National Park Service and the various States through emergency conservation activities, motivated the drafting of what is known as the State park bill (S. 3742 and H.R. 9788 of the 72d Cong.).

This legislation proposes to give the Secretary of the Interior power to authorize the National Park Service, cooperating with the Federal agencies, to make a comprehensive study of the public parks, parkways, and recreational area programs of the United States. The Park Service would be authorized to aid the several States in planning, establishing, improving, and maintaining these areas. The bill would also authorize the Secretary, subject to the approval of the President of the United States, to transfer to any State, by lease or otherwise, such public lands as he deemed advisable under the provisions of the bill. Should the lands be diverted to improper use they would, under the bill, revert to the United States.

This bill received the cordial and sympathetic support of the Secretary of the Interior. With a few minor amendments it was favorably acted upon by the Senate Committee on Public Lands and Surveys and by the Committee on Public Lands in the House of Representatives. Introduced late in the session, it failed of passage in the House during the last minute rush before adjournment of the Seventy-third Congress. It is hoped that some legislation along lines laid down in this bill may receive early attention by the new Congress.

STATUS OF PARK AND MONUMENT LANDS

Since the acquisitions of new areas reported in the annual report for 1933, and covering land changes to September 30, 1933, no new areas have been added to the system. However, jurisdiction over the 16 national monuments transferred by the President's Executive order of June 10, 1933, from the Department of Agriculture to this Service was not assumed until November 1933. With these areas the national monuments number 67.

LANDS ADDED TO EXISTING MEMBERS OF SYSTEM

Lands were added as follows to several members of the national parks system to include areas of scenic, historic, or scientific importance:

Acadia National Park.—The total area of this park was increased to 13,832.24 acres by the donation of 1,520.13 acres to the Government.

Great Smoky Mountains National Park.—An area of 97,725.72 acres was added by conveyances from the States of North Carolina and Tennessee, bringing the total area of the park up to 394,088.35 acres. The total acreage necessary for complete development of the park has been set by Congress at 400,000. The North Carolina section of the park was brought to completion on May 1, when title to two large tracts owned by the Ravensford and Suncrest Lumber Cos. passed to the United States.

Condemnation proceedings already have been instituted to acquire the last large tract of land involved—the Morton Butler property, comprising 25,000 acres. In addition there remain 76 small holdings, 5,364.74 acres in all, to be brought into the Tennessee part of the park.

Fredericksburg and Spotsylvania County Battlefields Memorial.—Within these areas a total of 53.37 acres were acquired. The total acreage within the Fredericksburg, Spotsylvania Courthouse, Chancellorsville, Salem Church, and Wilderness areas is 2,413.37 acres.

Petersburg National Military Park.—Eleven acres were acquired, bringing the area to a total of 509.99 acres.

Stones River National Military Park.—The area of this reservation was increased to a total of 410.60 acres by new acquisitions.

Vicksburg National Military Park.—An area of 0.46 acre was added to provide a site on which to place a bust of Brig. Gen. A. J. Smith. This brings the total area to 1,322.46 acres.

Pinnacles National Monument.—By proclamation dated July 11, 1933, 5,001.78 acres were added to the Pinnacles Monument, bringing the area to 9,908.39 acres.

PENDING BOUNDARY PROBLEMS

No important pending boundary problem was adjusted during the year. The situation concerning boundary adjustments long recognized as vitally important to the administration of the parks and the welfare of the native wildlife is as follows:

Yellowstone National Park.—No congressional action yet has been taken upon the report of the Yellowstone Park Boundary Commission filed in 1930. This Commission, headed by Dr. A. E. Morgan, now chairman of the Tennessee Valley Authority, recommended the immediate addition of the Bridger and Two Ocean Pass region to Yellow-

stone Park and pronounced that portion of the Thorofare-Upper Yellowstone watershed adjacent to the east boundary of Yellowstone Park to be of national park quality.

Rocky Mountain National Park.—Addition of the mountain and glacier country to the south, included in the original park plan, and of a small acreage to permit a proposed parkway planned to bring the new Trail Ridge Road to a suitable terminus at park headquarters near Estes Park should be made possible through legislation.

The Grand Lake addition, previously authorized by Congress, can be established by Executive proclamation as soon as plans are completed for the improvement of Grand Lake Village to resemble a typical frontier village.

Yosemite National Park.—One project of interest in the national park completion program is the restoration of the Minaret region to the park. The nearby Devils Postpile area now a national monument was transferred to the jurisdiction of the National Park Service from the Forest Service under the Executive order of June 10, 1933. The larger area, however, should be restored to Yosemite National Park in the interests of good administration.

Sequoia National Park.—No developments occurred during the year in connection with the plan to add to this park the Mineral King region at the head of the watershed of the East Fork of the Kaweah River. The remainder of the watershed is within the park.

General Grant National Park.—Minor adjustments on the east and south lines of General Grant Park are required for administrative and protective purposes. The problem is one merely of adjustment of boundaries rather than a material increase in acreage.

Kings River project.—Another area near Sequoia and General Grant National Parks, the Kings River area, has long been considered, both as an extension to Sequoia Park and as a separate park area. This project was recommended many years ago by the great naturalist John Muir. Both Directors Mather and Albright made constant efforts throughout the course of their administrations to bring Kings River under park administration, but local irrigation and power interests continue to oppose the plan. The State road now nearing completion into the canyon inevitably will bring about a recreational use of the area, and it is urged that if such use is to be permitted it should be under the supervision of the National Park Service in connection with the administration of the nearby Sequoia and General Grant National Parks.

Grand Teton National Park.—Success for this project seemed near toward the close of the last session of Congress when a bill to enlarge the park passed the Senate. It failed, however, to come up for a vote in the House. It is expected that a similar bill will be introduced during the next session.

The proposed bill provided for the addition of more than 30,000 acres of private lands acquired by John D. Rockefeller, Jr., for the purpose, over 40,000 acres of the unappropriated public domain, and a tract of national-forest lands including the northern third of the Teton Range, Jackson Lake, and the road to Yellowstone Park to the north.

This bill differed from previously proposed legislation in that it provided for the administration of a special wildlife area by the Biological Survey and for Government compensation to those counties in which private lands would be withdrawn from taxation. These provisions provided a solution for the problems interfering with the park extension in the past.

Grand Canyon National Park.—The necessity of making Grand Canyon Park a complete biological unit as well as a scenic reservation has been emphasized for many years by scientists, including John C. Merriam, president of Carnegie Institution of Washington. To this end it has been urged that the park be enlarged both to the north end and to the south of the Great Gorge to include a complete range of life zones and biological conditions. The economic development of natural resources within this proposed extension unfortunately places the probability of its addition to the park far into the future.

Crater Lake National Park.—The Diamond Lake area to the north, proposed for park extension, now is administered by the Forest Service. It is still considered essential for the future development of Crater Lake National Park.

Carlsbad Caverns National Park.—The Guadalupe Mountains region, once considered for establishment as a separate park unit, is now being studied as a possible addition to Carlsbad Caverns. It would add a very fine surface scenic area and excellent wildlife attractions to the existing park. As the proposed extension involves a portion of the Lincoln National Forest, the matter will be submitted to the Secretary of Agriculture for consideration.

Hot Springs National Park.—It has been suggested that additional recreational facilities be added to the existing medicinal facilities of Hot Springs Park by including Sugarloaf Mountain, North Mountain, West Mountain, and the eastern shore of Lake Hamilton within the boundaries. This matter is to be studied.

Platt National Park.—Reports as to the outstanding geological phenomena of portions of the Arbuckle Mountains have led to the suggestion that certain areas therein be added to Platt National Park, to be connected by a parkway. These tracts are Indian allotments from which it is reported the Indians have been unable to derive any income. An investigation is yet to be made to determine the advisability of this extension.

Wind Cave National Park.—A proposed extension to this park would include the canyon to the north to provide for an approach road. Negotiations for transfer of the game preserve managed by the Bureau of Biological Survey of the Department of Agriculture are under way.

National monuments.—Several proposals have been made for the extension of boundaries of various national monuments. They cannot be considered in detail here. However, two important extensions are being considered for Glacier Bay National Monument in Alaska, and Mount Olympus National Monument in Washington. The proposed Glacier Bay extension embodies a change of boundary lines from the mountain divides outward to the west and south to shores of the surrounding bays and inlets. The purpose of this proposed extension is to provide a complete biotic unit for the Alaska Brown bear, to provide accessible recreational features, and to facilitate boundary patrol.

There has been agitation for many years concerning the enlargement of the Mount Olympus National Monument on the Olympic Peninsula in Washington. After its original establishment as a national monument under the Forest Service, the area was reduced several different times by presidential proclamation. Now a movement is on foot to restore the original boundaries, and even increase them to include important recreation area with the end in view of changing its status to that of a national park. Any extension of boundaries will provide additional winter range for the large herd of Olympic Elk for the safety of which the monument was originally established.

Minor changes in monument boundaries which are under active consideration at present are those of Muir Woods, Chiricahua, Dinosaur, and White Sands National Monuments. The Muir Woods extension is nearly completed, the only remaining step being the actual signing of the proclamation by the President. The additional area will provide a suitable site for an administration building. The proposed additions to Chiricahua and White Sands are still under consideration.

PROGRESS TOWARD CONSUMMATION OF NATIONAL PARK AND MONUMENT PROJECTS AUTHORIZED BY CONGRESS

Satisfactory progress toward consummation of parkhood for several national park projects authorized by Congress may be reported.

Shenandoah.—The Virginia State Commission on Conservation and Development is entering the final stages preparatory to presenting to the United States deeds to the Shenandoah National Park. Minor matters such as clearance of titles and removal of squatters remain to be accomplished.

Mammoth Cave.—Assurances have been given that the lands necessary to establish the Mammoth Cave National Park soon will be acquired by the Federal Government. This will be possible under the provisions of the act of Congress approved May 14, which defined a minimum area of 20,000 acres for administration and protection by the National Park Service. No general development for public use may be undertaken, however, until the major portion of the remaining lands specified for park inclusion, including the caves thereof, have been accepted by the Secretary of the Interior.

Isle Royale.—The status of the Isle Royale project remained practically unchanged during the year.

Everglades.—The proposal to establish the Everglades National Park in southern Florida received official sanction when approved by President Roosevelt on Memorial Day.

This project, when completed, will add to the system its only tropical national park. Long stretches of beaches, particularly in the Cape Sable region, mangrove forests, vast stretches of the plains-like Everglades with intricate waterways, and unique flora and fauna will provide unlimited sources for study and recreation.

Delineation of boundaries of the proposed park by the Secretary of the Interior, within a maximum taking area of 2,000 square miles, is provided by the act authorizing the Everglades Park establishment. Studies will be made by the National Park Service this coming fall and winter to determine the actual boundary lines desired. It is understood that after approval of the proposed boundary, a commission will be appointed by the Governor of Florida to acquire the necessary lands.

The act further provides that all privately owned lands within the area shall be donated to the United States before it can assume park status, and in addition that the Federal Government, for the period of 5 years from the date of the act, shall not expend any public moneys for the protection, administration, or development of the park.

Bad Lands National Monument.—Establishment of this monument under the terms of the authorization of Congress approved March 4, 1929, is contingent upon the acquisition by the State of South Dakota of private lands within the proposed boundary, and their transfer to the Federal Government without cost; also upon the construction by the State of an approach highway.

Steps now are being taken by the State toward the completion of the highway, but there appears no probability that the necessary lands for the national monument will be acquired in the near future.

Monocacy National Military Park.—On June 21, 1934, President Roosevelt approved the act authorizing the establishment of the

Monocacy National Military Park, in Maryland, upon the donation of the necessary lands to the Federal Government.

Ocmulgee National Monument.—By act of Congress approved June 14, 1934, the establishment of the Ocmulgee Monument in Georgia was authorized to preserve Indian mounds of great historical importance. Actual establishment of the monument is contingent upon the donation of the lands involved to the United States.

Pioneer National Monument.—As its name indicates, this monument, when established, will be of historical interest. Approved by act of Congress June 18, 1934, when established it will include four areas connected with Daniel Boone, famous Kentucky pioneer. It is planned to connect these four points with a memorial highway. The lands for this monument also must be donated to the Federal Government.

INVESTIGATION OF PROPOSED PARKS AND MONUMENTS

A total of 91 recommendations for the establishment of national parks and 106 for national monument establishment have been presented to the Service in the past. Of 31 national park proposals investigated during the past year, 8 were reported favorably and 23 adversely. Of 38 national monument proposals investigated during that period, 9 were reported favorably and the remaining 29 were reported adversely. There still remain 54 proposed national park areas and 72 proposed national monument areas to be investigated. Several of these will be investigated during the coming year.

The problem of investigating all of the areas proposed for parks and monuments is a difficult one. Due to an insufficient personnel it has been necessary to postpone examination of less important ones in favor of those demanding immediate action. Practically all of this work has been done in the past by Roger W. Toll, Superintendent of Yellowstone National Park. It is necessary for him to do the investigation work during the winter season when his presence in Yellowstone is not imperative.

PROGRESS IN RESEARCH AND EDUCATION

The naturalist and historical educational programs have advanced to new levels of development despite stringent curtailment of the regular park budget. Various forms of emergency relief, such as Public Works and Emergency Conservation Work, continued to provide a temporary means of dealing with the heavy demands on both the administrative and educational machinery of the Service occasioned by the addition of many new areas through the reorganization of the Federal parks system. But for the aid of these emergency activities and that of the Civil Works Administration for a brief period during the winter and early spring, the educational

program could not have operated successfully, especially in the archeological and historical areas where, thus far, very little permanent machinery exists. In these eastern historical areas, where educational activities are being tested out for the first time, thousands of visitors already have tried out the new order of things and have seen for themselves what it means educationally to visit the places where great national events occurred, while at the same time obtaining from a highly trained personnel a clear story of the historical situation.

Notable progress has been made in furnishing variety in types of guided trips to meet public interest and in providing additional auto caravans to notable features. A greater diversity of lecture subjects has been attempted and museum exhibition initiated in many places and improved in others. There is a distinct trend toward utilizing more mature men on the educational staff than heretofore and toward better methods of helping the visitor to understand and appreciate main features.

The impetus given nature studies by the National Park Service, which this year introduced nature walks into the National Capital parks, now has been carried over into State parks and even into municipal parks. The National Recreation Association is contemplating similar programs in connection with playgrounds.

The usefulness of such observation stations as the Yavapai Station on the south rim of the Grand Canyon and the Sinnott Memorial at Crater Lake, which were especially designed to help people understand scientific features, is more apparent each year. There is a growing demand now for similar stations at Bryce Canyon and on the north rim of Grand Canyon.

The Yosemite program was the first to furnish specialized field trips in geology, trees, flowers, and birds, in addition to the regular nature walks. Innovations in the form of an exploration hike, a half-day spent exploring away from the trails, with the destination a surprise, and a moonlight hike to view the sunrise attracted such crowds that handling was difficult. Two auto caravans devoted to Indian legends and to history have proved their worth. The so-called "matinee" or question hour in one of the camp grounds continued popular.

The intimate personal service to the visitor afforded by custodians of national monuments continues to constitute an educational program of which the Service is very proud. Small groups led about prehistoric ruins secure dependable and useful information in interpreting what they see.

MUSEUM DEVELOPMENTS AND EXHIBITS

New museum exhibits have been provided at Bryce Canyon National Park. At Yosemite backgrounds have been painted for life zone groups and many exhibits rearranged. At Sequoia the museum is being renovated and new exhibits installed. The museum at Rainier has also been renovated and many new exhibits provided. These improvements and many others have had expert supervision by museum experts of educational field headquarters at Berkeley. Attention is now being given the planning and construction of exhibits for new museums at Aztec and Scotts Bluff National Monuments and the historical museum planned for Rocky Mountain National Park.

Funds were provided under the Public Works program for the construction of a park museum at Morristown National Historical Park; for an addition to the present museum at Mesa Verde National Park; and for the reconstruction of the Reynolds House Museum, Moore House, and Swan Tavern (administration building) at Colonial National Monument. Public Works funds also were provided for administration buildings in which museum space is provided for Aztec Ruins and Scotts Bluff National Monuments and Chickamauga-Chattanooga, Vicksburg, Guilford Courthouse, and Shiloh National Military Parks.

Under emergency allotment the field division of education was enabled to inaugurate a program of construction of museum exhibits. During this program 129 projects were completed, including relief maps, relief models, habitat groups, miniature models of extinct prehistoric animals, cremation burials, metal labels for botanical gardens, models of architectural details, and drawings. This program also provided numerous photographs and lantern slides for use in park educational programs.

In the East similar activities were initiated. Models of the Yorktown battlefield were made in a workshop established at the Colonial National Monument and later a centralized model laboratory for the East established at Fort Hunt, Va. Nontechnical assistance in this work was furnished through the Civilian Conservation Corps camps.

NATIONAL PARK EXHIBITS AT A CENTURY OF PROGRESS

In addition to last year's exhibits at A Century of Progress Exposition in the Hall of Science and the Federal Building, which were renovated and again placed on display, there was installed in the medical section of the Hall of Science a general educational exhibit sponsored by the Hot Springs Chamber of Commerce, showing what the Government is doing in Hot Springs National Park.

PROGRESS IN HISTORICAL FIELD

The historical work has grown far beyond normal expectations. The establishment of the Colonial National Monument in 1930-31, followed by the Washington Birthplace National Monument and the Morristown National Historical Park, gave new impetus to the historical work begun back in 1906 when the Antiquities Act was passed by Congress giving authority for the reservation, by presidential proclamation, of areas of historic, prehistoric, or scientific interest, to be protected in national monuments. That year the El Morro National Monument became the first historic area to be included within the national park and monument system. The prehistoric already was represented by Casa Grande, and in 1906 Mesa Verde National Park and Montezuma Castle joined the prehistoric group.

The addition of the Colonial, Washington's Birthplace, and Morristown areas was but a normal growth in the historical field. But the Service was not long left to work with this normal problem. When the Executive order of June 30, 1933, added to that field national military parks and monuments, national cemeteries, and battlefield sites, the National Park Service was faced with the necessity of laying plans to build its program of interpreting these areas to the public as it had been doing for the other parks in the system.

Naturally, the bringing of so many areas of historical importance into the system placed new demands upon the historical service. The additional problems occasioned by the transfer of the military parks, monuments, and battlefield sites from the War Department created a need for additional personnel with training in history. In meeting this need, as mentioned elsewhere, the various emergency programs were of inestimable value.

LIBRARY DEVELOPMENTS

Plans have been studied for the development of adequate library facilities for national parks and national monuments. In many of the new administration buildings authorized under the Public Works program space is provided for library purposes.

Some progress was made in library work under the Civil Works program at educational field headquarters at Berkeley, Calif. During this period four workers were engaged in research and clerical work in connection with preparing an annotated bibliography. The research workers cooperated with the library workers by supplying annotated bibliographies compiled when manuscripts were written. These restricted bibliographies have become a part of the general bibliography.

In all of the library work the University of California and the School of Librarianship extended generous aid and unusual privi-

leges, permitting the use of laboratory room and desk equipment. Calls were made upon the librarians of four institutions in northern California for the purpose of soliciting duplicate materials to be presented to the National Park Service.

The small fund appropriated each year is inadequate to care for library needs and there is grave need for trained personnel to develop and carry out a well-organized library program throughout the park system. The able work of a special committee of the American Library Association, headed by C. E. Graves, has stimulated interest and provided a plan of development.

THE EDUCATIONAL ADVISORY BOARD

The Educational Advisory Board at its annual meeting on February 26-27, 1934, discussed the National Park Service policy of complete protection for all fauna in the national parks. In view of the fundamental duty of preserving the wildlife of the national parks in its present status and the ever-present danger of dissemination by disease, the Board requested the Wildlife Division to prepare a plan for the development of specific research activities on large game animals and other forms of animal life in Yellowstone National Park. A museum development plan for the park system was discussed and approved.

In connection with the proposed reclassification of areas now administered by this service, the Board recommended that the classification "national parks" be retained to embrace the great scenic national parks all of which now bear this name by act of Congress; provided, however, that in the judgment of the Board, Hot Springs, Platt, Wind Cave, Abraham Lincoln's Birthplace, and Fort McHenry National Parks should be placed in more appropriate park categories in view of the fact that their characteristics are so essentially different. The Board was in agreement that it would be desirable to retain in the category of national battlefield parks those areas notable only for the one feature of having been a battlefield.

The national park library program was discussed and it was the opinion of the Board that adequate working libraries should be encouraged in the several parks as needed, rather than combined in a centralized library, and that centralized administration be maintained for the purchase of books, union cataloging, and interchange of books to various park libraries.

YOSEMITE SCHOOL OF FIELD NATURAL HISTORY

The Yosemite School of Field Natural History, a training school for naturalists desirous of entering national park work, held its tenth session. A fine group, consisting of 12 men and 8 women,

was enrolled. For the first time applications from men far outnumbered those from women. The course this year included a week devoted to intensive ecological study and a 2 weeks' pack trip to the remote northern sections of the park. The class, almost entirely graduate students, was divided into committees to work under two noted instructors of the University of California and a member of the National Park Service Wildlife Division. An increasing number of graduates of this school are finding employment as naturalists. Five of last year's class obtained ranger naturalist positions in the parks this year.

EMERGENCY CONSERVATION WORK EDUCATIONAL PROGRAM

Soon after the beginning of Civilian Conservation Corps work in national parks, programs of lectures and field trips were placed in effect where naturalist service was available. Assistant Director Harold C. Bryant, as a member of the advisory committee, helped to plan the more permanent program under the direction of the Office of Education, which provided for educational advisers and leaders. In order to provide visual instruction, projectors were provided and many educational films purchased and produced, most of which were sound films. In addition each park camp was furnished with a film-strip projector and strip films were furnished regularly. Production of motion-picture films by the Park Service has made possible a regular distribution to camps located in national parks and monuments.

COURSES OF INSTRUCTION IN NATIONAL PARKS CONDUCTED BY OUTSIDE INSTITUTIONS

Various universities and colleges continued to send field classes to the different park and monument areas. The Omnibus College, consisting of approximately 500 people, mostly school teachers representing every section of the United States, visited several military and historical parks east of the Mississippi River, indicating increasing interest in these projects in addition to the usual western tour. Oglethorpe University and Southwestern Teachers College groups again toured the national parks.

Professor Meal, of Southern Oregon State Normal School, took a group of geology students to the Lassen Volcanic National Park. Although the weather prior to their work in the park interfered with schedules to such an extent that the group was forced to abandon some of its projected plans and shorten observations in all cases, the school hopes to make this a part of the required field work in general geology in the future.

The Winold Reiss Art School, under the auspices of the College of Fine Arts of New York University, began its summer session in Glacier National Park on June 15, to continue for 3 months. The

school is located at the picturesque chalets on St. Mary Lake, one of the most noted of the 250 lakes in the park. Courses include drawing, painting, sculpture, and mural work.

Arrangements were made for holding the fourth University of Hawaii summer session in Hawaii National Park from June 18 to July 27. Seven courses are offered, each giving residence credit toward a degree on the same basis as courses given on the campus in Honolulu.

SCIENTIFIC RESEARCH

A number of interesting scientific studies were made in the national parks and national monuments during the past year. A report was submitted by the Wildlife Division recommending procedure to coordinate the research reserves plan with basic park policies and the administrative code.

In Yellowstone National Park geological research was carried on by graduate students from Columbia, Chicago, Princeton, New York University, Western Reserve, and Vanderbilt. Eleven students spent most of the summer on work in the park or problems connected with the geology of the park region and at least 15 others entered the park at different times from the Red Lodge School for short periods. Prof. William Taylor Thom, Jr., of the geology faculty of Princeton University, was director of the International School of Geology at Red Lodge, Mont., and was largely responsible for the geological program attempted. Other problems, which when solved will lead to important results in connection with Yellowstone geology, have been worked on by C. J. Hares and Prof. Walter Bucher.

Various governmental, semipublic, and private agencies have continued to aid materially. Dr. A. P. Meinecke, of the Bureau of Plant Industry; Dr. O. J. Murie, of the Bureau of Biological Survey; Dr. T. S. Palmer, formerly of that Bureau; Harry Hommon, of the United States Public Health Service; Dr. A. S. Hazard, of the Bureau of Fisheries; Dr. J. C. Merriam, of the Carnegie Institution; Dr. Alexander Wetmore, of the Smithsonian Institution; and Dr. Waldo G. Leland, of the Council of Learned Societies, have each of them personally and through the organizations they represent assisted the work of the national park program. Dr. Charles Moore, of the Fine Arts Commission, has given generously of his time to the careful investigation of many problems relating to the work, as has Mr. H. P. Caemmerer, the secretary of the Commission.

Investigations range in subject matter all the way from fine arts and history in the District of Columbia and vicinity to geology, plant and fish life, and archeological excavations in the Southwest and far West. In the latter connection, the work of Jesse L. Nusbaum, of the Laboratory of Anthropology at Santa Fe; Earl Morris, of the Carnegie Institution; Dr. Harold S. Colton, of the Museum of Northern Ari-

zona; and Neil Judd and F. H. Roberts, of the Smithsonian Institution, has been outstanding in giving help on numerous matters which have been referred to them.

Dr. John C. Merriam, president of the Carnegie Institution of Washington, has continued studies of the scientific features of various parks and methods of presenting the findings of scientists to the general public. A preliminary report has been prepared by a committee of three men headed by R. W. Leighton, chairman of research in the University of Oregon, who have been studying ways of presenting the beauty of Crater Lake in such a way as to have the public appreciate it. Dr. H. C. Bumpus continued studies of educational methods in Yellowstone National Park. Dr. H. E. Gregory continued geological studies in Zion National Park for the United States Geological Survey. Dr. N. E. A. Hinds, of the University of California, continued geological studies in Grand Canyon. The Museum of Northern Arizona has continued archeological research in the ruins of Wupatki National Monument. Many other eminent scientists visited the national parks pursuing independent investigations.

SCIENTIFIC DISCOVERIES

Several discoveries of interest to science were made in the national parks during the past year. In Crater Lake National Park there was discovered a carbonized stump covered by volcanic ash on the rim of the lake. In Yosemite National Park, lying against an ice pillar on Mount Lyell Glacier, was found a mountain sheep ram in a fine state of preservation. This was a rare find and created much comment throughout the country. Wider distribution of the Mount Lyell salamander is indicated through the finding of this rare amphibian on Half Dome.

New in the history of the Mesa Verde is the discovery of a grave containing the skeletons of two Indians of prehistoric times. The significance of this find is that to find two bodies rather than one or several is unusual. Important mammal bones were recently taken from a deep creek in Kaibab limestone in Wupatki National Monument. Archeological research in western historical areas has led to some extremely interesting scientific information concerning early American glass, china, and pottery ware, as well as many other articles of domestic use. Perhaps the outstanding finds of the year in this field are in the Ocmulgee Fields at Macon, Ga., a national monument project, where an ancient cornfield and kiva-like structure dating back approximately 1,000 years, have been found.

ANIMAL CONDITIONS

The year witnessed important progress in the wildlife program. Wildlife administration has been brought under the advisory supervision of the Wildlife Division and is carried out under the policy which was adopted by the Service this year as a basic guide.

Among many projects which moved forward this year are the following:

A program for the construction of bear-proof safes and bear-proof garbage cans has been inaugurated under Emergency Conservation Work funds as an experiment at West Thumb camp ground, to make food unavailable to bears within this camp ground and to provide adequate facilities for the food supplies of campers in such manner that they will not be forced to leave food in their tents or automobiles, which practice has occasioned loss of personal property to campers.

Of the surplus buffalo rounded up in Yellowstone National Park, 12 live shipments were made and 165 were slaughtered and sent to nearby Indians. An attempt is to be made to establish a portion of the buffalo herd in Hayden Valley where it will be more apt to be seen by visitors.

A study is being made of the Roosevelt elk in the Mount Olympus National Monument. Reports thus far received indicate that the Roosevelt elk is not in danger of extermination. The northern Yellowstone elk herd is far too large for the winter range and a study is being made with a view to alleviating this condition. The tule elk, which have been in Yosemite National Park as exotics, have been successfully transplanted to Owens Valley on the east side of the Sierra.

Trumpeter swan censuses have been made throughout the year. Twenty mounted and framed enlargements of the trumpeter swan were sent out to the various duck clubs and agencies concerned throughout the Yellowstone and Red Rock Lakes region, advertising the present status of the trumpeter swan and advocating caution during the hunting season. This action resulted in Montana's posting a \$50 reward for the arrest and conviction of anyone convicted of shooting a trumpeter swan. Visitors are discouraged from going to any of the lakes where swans are known to breed. It is hoped that these measures will help protect this rare species.

White pelican fledglings of the year were banded at the pelican rookery in Yellowstone Lake, which should lead toward more definite knowledge of the migration route of these parasite-infested pelicans and to a better understanding of the possible influence they may have on distribution of this parasite.

Fifteen deer were shipped from the Mount Vernon estate to the proposed Shenandoah National Park area. They were released in

Big Run Valley on the west side of the mountains approximately midway between the Spotswood Trail and the south end of the proposed park. This is one of the wildest and most isolated sections of the park and an ideal location for deer, with plenty of food and cover. There are no inhabitants along the ridge within 8 or 10 miles of Big Run.

Favorable reports have been received regarding moose except in the proposed Isle Royale National Park, where, it is reported, there is insufficient forage.

Better conditions prevail among the Kaibab deer. Favorable conditions are reported for antelope and they are seen in increasing numbers in Petrified Forest and the south rim of Grand Canyon. Improvement is shown in the condition of mountain sheep in Mount McKinley.

An Emergency Conservation Work wildlife program has been inaugurated and set up in various of the national parks. Naturalist technicians and naturalist assistants are being assigned the duties of safeguarding food and cover of animal life by directing Civilian Conservation Corps activities to the end that breeding grounds and food of wild birds and animals are not destroyed, by securing fundamental data on the kinds, life histories, and habits of animal life, and by offering recommendations as to proper management and restoration programs.

FISHING AND FISH-CULTURAL OPERATIONS

Mr. David H. Madsen, fish expert of the National Park Service, has been designated liaison officer for this service with the Bureau of Fisheries and State fish and game commissions, and plans are being made for improving fish-planting programs and fishing conditions in the parks. A long-time planting program is being prepared for each park. Special stress is placed upon the policy of not introducing exotics where native species can be maintained.

Arrangements have been made with the State Game Commission of Utah to exchange with the National Park Service a million rainbow eggs, the fish when hatched to be planted in Yellowstone National Park.

Excellent fishing conditions were maintained in the parks in spite of drought conditions and unusually good catches were reported by anglers.

PUBLICATIONS

The serious cut in funds available for printing during the past 2 years, which resulted from the effort to reduce the regular running expenses of the Federal Government, was almost disastrous this

year, with more people than ever visiting the national parks and inquiring about them. The small supplies of circulars it was possible to issue in the spring of 1933 were exhausted early in 1934, and before the close of the 1934 fiscal year field officers were complaining that their supplies of printed information for that year were approaching the point of exhaustion. It is imperative that larger funds for the printing of circulars be made available if the service is to meet the responsibility of furnishing information concerning the Nation's national parks and monuments.

For the first time a separate information circular was printed for General Grant National Park. Formerly the Sequoia and General Grant Parks were treated in the one booklet. A circular also was printed regarding the recently established Death Valley National Monument. Extensive revisions were made in the park booklets and the new offset method, last year adopted for some of the park circulars, extended to all of them. Small editions of information circulars for Platt National Park and the National Capital Parks were issued by the multilith process, as funds were not available for printed booklets. Folders concerning several of the military parks also were issued by this process as an emergency measure.

A reprint edition was issued of the publication entitled "The National Parks and Emergency Conservation," issued last year to acquaint members of park Civilian Conservation Corps camps with park ideals and purposes. It is of especial value at the present time in filling requests for general park information since the publication *Glimpses of Our National Parks* is exhausted. Copy for a new edition of the latter booklet now is in course of preparation.

A brochure entitled "Wildlife Management in the National Parks", the second in the fauna series, was prepared by George M. Wright and Ben H. Thompson of the Wildlife Division, and will be submitted soon to the printer. Since the first volume of the fauna series was issued in 1932 much has transpired in the field of wildlife management and it is desirable that these matters be presented to the attention of those people who watch with analytical interest the administration of the parks and particularly the welfare of the game animals of the country.

Motorists guides for Glacier, Yellowstone, Yosemite, and Rocky Mountain National Parks were printed by the Geological Survey and the entire editions forwarded to the parks for which issued, for distribution to incoming motorists.

In accordance with a plan to issue pocket-size recreation areas map folders for each of the 48 States and the Territories of Alaska and Hawaii, copy for most of these maps was prepared and maps issued by the multilith process for Colorado, Idaho, and Montana.

VISUAL EDUCATION SERVICE

One of the most effective means of bringing the national parks and monuments to the attention of our people, and one that is limited only by the amount of material available, is through the distribution of motion-picture film and slides. As yet no adequate supply of films has been obtainable, due to lack of funds. It is urgently recommended in this connection that sufficient money be made available to permit the Service to cooperate with university-extension services in furnishing park film and to meet the requests upon it from schools, civic and travel organizations, churches, and clubs for such material.

During the year 333 motion-picture films were borrowed from this office by such organizations. Individuals and organizations also used 7,359 lantern slides and 11,099 pictures from this Service. The large number of pictures withdrawn for use in preparing film strips for distribution to the Civilian Conservation Corps camps and for use in Service publications was not included in this count.

Under the educational program adopted in connection with the Civilian Conservation Corps camps, 1,320 film strips were produced and 550 reels of sound and silent films.

In order to produce a limited supply of colored pictures for use in traveling exhibits and also to place on the walls of Government buildings and in other prominent places where they would serve to call attention to the park areas, an enlarging library also was established under Public Works Authority and enlargements made from national-park negatives.

MATHER MEMORIAL PLAQUES

In accordance with the purpose for which the Stephen T. Mather Appreciation was formed, 25 memorial plaques have been presented to the National Park Service by the Appreciation for placement in national parks and monuments throughout the country as memorials to the first director of the Service. With the exception of 6 plaques, all of these tablets have now been installed and the majority of them dedicated. Three of the unplaced plaques have been sent to General Grant, Hot Springs, and Mount McKinley National Parks, and locations for them are now under consideration by the Branch of Plans and Designs. The three remaining plaques are destined for places of honor in the East, where Mr. Mather did so much to develop the national-park idea. Prior to the establishment of the Great Smoky Mountains National Park in 1931, Acadia was the only national park east of the Mississippi River, where our large centers of population are found. As soon as the Great Smoky Mountains and Shenandoah areas are sufficiently developed, fitting locations will be chosen and the plaques installed and dedicated.

By special congressional authorization, a plaque will be placed in one of the park developments of the Nation's Capital. A site has not yet been chosen, but a location along the proposed George Washington Memorial Parkway near the Great Falls terminus will probably be considered.

WINTER USE

Between-season travel figures for the period from October 1, 1933, to April 30, 1934, show that winter use of the national parks increased phenomenally during the past year, although weather conditions on the Pacific coast were exceptionally mild. In spite of the poor conditions for winter sports that naturally resulted, public interest in these activities actually increased. If this condition was brought about, as Park Service officials believe it was, through the new national attitude toward leisure, the winter of 1933-34 is an indication of what may be expected in the future, and the National Park Service is making careful observations to guide it in developing the parks for widespread winter use.

Yosemite National Park continued to lead the list for winter sports activities and general winter use. The Wawona Road between Yosemite Valley and the Mariposa grove of big trees was kept open for the first time in winter, making the splendid ski fields at Chinquapin accessible. These fields have been classed by experts as among the finest ski slopes in the world. From the middle of December until the end of February special events were scheduled, beginning with the annual Yosemite Winter Club frolic officially opening the winter sports season in the park. The season's program featured ski races, speed skating, hockey, skijoring, sleighing, and dog-team sleds. The fourth annual San Joaquin Valley-Sierra Winter Sports Carnival was held on January 13 and 14. Its success was attested by the largest attendance and the greatest enthusiasm accorded any of the previous carnivals. Travel to Yosemite during the winter period increased 27 percent over that for the year before.

Winter use of Sequoia and General Grant Parks was also marked by a substantial travel increase over the previous winter—37 percent for Sequoia and 120 percent for General Grant. The first winter-sports carnival ever held in Sequoia took place on February 25 at Lodgepole Camp, where conditions for such activities are regarded as among the finest in California. When the road from Giant Forest to Lodgepole is surfaced, it may be expected that the number of visitors will greatly increase. Otto Steiner of the German-Austrian Alpine Association made the first ski trip from Giant Forest to Mount Whitney. He accomplished the 200-mile journey in 5 days and succeeded in getting within a hundred or so feet of the top of the mountain. Overhanging banks of snow whipped by high winds made it unsafe for him to proceed farther on account of falling snow.

Winter sports events have long been a part of the regular schedule in Mount Rainier National Park, known throughout the country as a famous winter resort. Recent developments, including the use of Paradise Valley as the winter playground of the Northwest, materially increased the winter use. Some idea of the popularity of snow sports in this area may be gained from the fact that reservations for accommodations the following winter were made in May and June by over 800 persons living in the cities of the Puget Sound region. Last winter saw the inauguration of the first annual silver skis championship, a 5-mile down-hill race from Camp Muir, 10,000 feet, to Paradise Valley, 5,500 feet. This event, held on April 22, was highly successful and set a new all-time week-end record for the number of cars entering the park during the winter season. The second annual snow-sport carnivals of the Tacoma and Seattle Chambers of Commerce also were highly successful. Winter travel to this park increased 54 percent over the previous season.

Although Lassen Volcanic and Crater Lake National Parks are not open all year, skiing events take place in both areas if conditions permit. A ski tournament attended by more than 1,100 persons was held in Lassen Park on April 8. Crater Lake was open to the traveling public more than 2 months in advance of the usual season, with the result that the number of visitors increased 120 percent.

All the other national parks that are open during the winter experienced marked travel increases over the numbers recorded for the previous year. The exact figures are not available for Acadia and Great Smoky Mountains National Parks, but the indications were that the winter travel was the largest experienced for several seasons. At Carlsbad Caverns, attendance increased 72 percent; at the south rim of the Grand Canyon, 56 percent; Hawaii, 288 percent; Hot Springs, 37 percent; Rocky Mountain, 45 percent; Zion, 90 percent; Wind Cave, 106 percent; and Platt National Park, 7 percent.

PROTECTION OF PARK FORESTS

Again during the fiscal year 1934 there was a notable expansion in the forestry work of the National Park Service, with the result that headquarters for that work were transferred to Washington under a new branch of forestry. Field headquarters for the western division of the Service were continued at Berkeley, Calif.

Part of the increase in forestry activities resulted from the reorganization of the national park and monument system effected under Executive order last August. By far the greater part of its activities, however, were in connection with the Emergency Conservation Work program for the national parks and monuments.

The forest protection and fire prevention allotment of the regular appropriation act for the fiscal year 1934 provided only very limited

allotments to the parks for essential fire-protection personnel and equipment. All forest protection improvements, insect and tree disease control work, and type mapping accomplished during the fiscal year were financed from the emergency appropriation, either under Emergency Conservation Work or Public Works. The forest protection accomplishments of the past year are, therefore, largely represented in the reports of the Emergency Conservation Work and Public Works programs.

Forest fire protection.—The presence of the Emergency Conservation Work camps within the national parks and monuments was of immense assistance as a fire protection measure through the availability and use of the Civilian Conservation Corps enrollees for fire patrol and fire suppression service.

Great Smoky Mountains National Park, with 2,588 acres burned over, and Yellowstone National Park, with 2,187 acres burned, were the greatest sufferers from forest fires during the season of 1933. While Glacier National Park had only 31 acres burned over within the park boundaries, its fire suppression expenditures were the largest by reason of suppression of a 2,400-acre fire immediately adjacent, which for a time seriously threatened the park but fortunately was controlled before crossing its boundaries.

A copy of the annual fire statistics for the calendar year 1933 may be found in the statistical section, on page 370.

Insect control.—The successful insect control work of the preceding years in Mount Rainier, Crater Lake, and General Grant National Parks has been maintained by follow-up work this past spring.

Insect control in Yellowstone National Park was confined to work along the park highways, in and adjacent to camp grounds, and to the white bark pine stand of the Mount Washburn region. The magnitude of the infestation in the lodgepole stands of the national forests adjacent to Yellowstone and Grand Teton National Parks and the great difficulties encountered in attempting to secure control, as well as the immense expenditure which would be required, made it necessary to forego the attempt for control of this lodgepole infestation in the so-called "Yellowstone project."

The most important insect control operations of the past year were undertaken in the magnificent forests of Sequoia and Yosemite National Parks, the largest operation having been centered in Yosemite National Park for the protection of the ponderosa and sugar pine stands.

Blister rust.—Blister rust control operations continued in Acadia and Mount Rainier National Parks and were initiated in selected white pine areas within the proposed Shenandoah National Park. In all three parks this work was accomplished by Civilian Conserva-

tion Corps enrollees under the Emergency Conservation Work program.

Type mapping.—Type mapping projects with special crews were carried on during the summer of 1933 in Glacier and Yellowstone National Parks. In many of the other national parks this activity was carried on through the assignment of regular members of the park organizations or through the use of Emergency Conservation Work personnel.

Fire equipment.—The most important additions to the fire protection equipment of the national parks were provided through the purchase of 4 fire trucks, each equipped with a 250-gallon water tank and booster pump, for forest fire suppression in Sequoia, Yosemite, Mount Rainier, and Glacier National Parks, and 1 truck primarily for fire protection for buildings at the south rim of the Grand Canyon.

Fire protection for buildings.—A fire protection engineer was added to the staff of the branch in order that the greatly increased number of building plans under the expanded emergency program might receive careful examination from the standpoint of fire protection provisions, and also that greater cooperation might be given the parks in the various phases of protection of buildings. Several field trips have been made by him for the purpose of making examinations and recommendations in regard to fire protection for buildings in national parks and monuments. Additional surveys of this character are planned.

Tree surgery and tree care.—With the addition of the military and historical parks and monuments, cemeteries, and National Capital Parks to the national park system an important phase of forestry work developed. In the intensively used portions of these areas, each individual tree is of importance and must be given consideration from the standpoint of pruning, feeding, cabling, girdling, root removal and, in special cases, cavity work. Work of this character has been supervised and inspected during the past year in nine military parks and cemeteries and in the National Capital Parks; and a tree census and sketch map have been prepared of all trees in 11 national cemeteries and monuments.

SANITATION IN THE PARKS

Last year, as during the past dozen years, the Public Health Service continued its cooperation in supervising matters of sanitation in the national parks and monuments of the West through its sanitary engineers stationed in San Francisco. Approximately 410 bacteriological and 60 chemical analyses were made in the Public Health Service laboratory in San Francisco of samples of water from various

sources of water supplies in the parks and monuments, to guard against contamination.

Under a new arrangement during 1934 district park rangers were assigned the duty of making general inspections of hotels, lodges, housekeeping cabins, stores, mess houses, all other places handling or serving food products or beverages, and swimming pools. These district rangers consulted with the sanitary engineers and received advice and assistance on special or unusual problems of sanitation.

In three of the larger national parks experienced employees devote all their time to supervision, operation, and maintenance of water-supply systems, incinerators, sewage-disposal plants, swimming pools, comfort stations, mosquito control, and other activities pertaining to sanitation. Conditions in these parks have made evident the importance of having in every park one well-trained employee whose primary duties are supervision and maintenance of water supplies, sewage and garbage disposal, and comfort stations, and cleaning of camp grounds.

Expansion of the national-park system in the East has brought up many new problems of sanitation, as has the transfer to the jurisdiction of the National Park Service of the National Capital parks and a number of public buildings in the District of Columbia. The Public Health Service has extended its cooperation to these new activities.

ENGINEERING AND LANDSCAPE ACTIVITIES

Under the various emergency appropriations made available to the National Park Service, as outlined elsewhere, an unusually large amount of construction work of various types was undertaken. More designs, working drawings, specifications, and estimates for park building construction were demanded, and more landscape layouts and planting plans for building groups, roadsides, and special areas in connection with such construction. Approval of the construction of scenic parkways on a scale hitherto undreamed of have required most careful supervision from engineering and landscape planning angles. The administration by the Service of a group of buildings outside of the national parks created a new field of activity for both architects and engineers.

So heavy was the pressure of work that in addition to utilizing the Service's force of engineers, architects, and landscape architects to the utmost, it was necessary in several cases to secure consultants' services for brief periods, such as in the extension to the executive wing of the White House.

Through availability of Public Works funds plans for three unusually large park buildings were prepared—a \$130,000 utility building in Yosemite and an apartment house and a utility building in Yellowstone, each at \$120,000. Construction of the \$100,000 apart-

ment house for employees at the Navy radio station on Schoodic Point in the Acadia National Park also required careful supervision, although in this case also the services of expert consulting architects were utilized. An unusually interesting project under construction at the close of the fiscal year is the four buildings comprising the Swan Tavern group, a reconstruction of the colonial hostelry at Yorktown, Va., in the Colonial National Monument, which disappeared during the Civil War.

PARKWAY PROJECTS

Following announcement last November by the Public Works Administration of approval by the President of a parkway project to connect the Shenandoah and Great Smoky Mountains National Park areas, and the allotment of funds for initiation of the work, extensive field explorations were made of the 500-mile distance involved. Advocates of many routes were interviewed and due consideration given construction feasibility and landscape conservation. Joint reports by landscape architects and the engineering experts were prepared and submitted to the Secretary on June 13. With funds allotted and portion of the route approved, the work will proceed expeditiously. To date \$6,010,000 has been allotted for surveys, plans, and construction of this parkway.

Also last November the sum of \$50,000 was allocated to the Service for the study of a parkway through the Green Mountains of Vermont. A special group has been studying various aspects of the problem and soon will submit its report.

Preliminary studies also were made of the proposed Natchez Trace Parkway.

PARK ROAD DEVELOPMENT

As in past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction in all areas administered by the National Park Service, with the exception of Mount McKinley National Park, Alaska, where road work has continued to be performed satisfactorily by the Alaska Road Commission.

The cooperative arrangement with the Bureau of Public Roads, as in former years, has been productive of noteworthy accomplishment under the direction of Thomas H. MacDonald.

There have been constructed, reconstructed, and improved to date (cleared, graded, and surfaced) 695.44 miles of roads. In addition, work in various stages of construction includes 493.11 miles of clearing and grading, and 521.79 miles of surfacing. Considerable progress has been made on construction of adequate trail systems, \$1,998,-847.43 having been expended on the construction of 780.48 miles of trails built on suitable standards of grade and alinement.

HISTORIC AMERICAN BUILDING SURVEY

Especially noteworthy from both historic and architectural standpoints was the historic American buildings survey, previously mentioned as a Civil Works project. The purpose of the survey was to secure exact physical records of antique buildings, important historically or architecturally. While this project was not without some good local precedent, it was the first time that such a national program ever had been carried into effect.

The program attracted a great deal of public attention and the results were gratifying in the extreme. About 5,000 sheets portraying 900 buildings were submitted through this Service to the Fine Arts Division of the Library of Congress. The drawings covered a vast range of subjects, from Indian pueblos to New England water-mills, and will form a valuable part of the archives of American social history.

While a vast amount of material was gathered, it represents only a fragment of the work that should be done. It is hoped that financial means may be found to continue this historic buildings survey on an active basis.

APPROPRIATIONS, DONATIONS, AND REVENUES

During the fiscal year 1934 the National Park Service was operated with funds supplied by direct appropriation acts, by amounts transferred from various appropriations for part-year operation of activities over which jurisdiction was formerly exercised by other governmental agencies, and by Public Works, Emergency Conservation Work, and Civil Works Administration allotments.

DIRECT APPROPRIATIONS, 1934 FISCAL YEAR

In the Interior Department Appropriation Act for the fiscal year 1934, the \$5,072,790 appropriated included \$2,435,700 for road and trail construction. However, as \$1,265,260 for administrative reductions was required by the Bureau of the Budget, the amount actually available for expenditure was reduced to \$3,807,530.

The Second Deficiency Act, 1933, appropriated \$180,000 but after providing for administrative reductions of \$45,000, in compliance with the Bureau of the Budget requirements, \$135,000 actually remained available for expenditure.

The Emergency Appropriation Act, 1935, included \$13,000 for salaries and expenses for part-year administration, protection, and maintenance of public buildings outside the District of Columbia. The Independent Offices Appropriation Act, 1934, appropriated \$10,000 for the Mount Rushmore National Memorial Commission, \$8,800 for the Commission of Fine Arts, and \$96,650 for the George

Rogers Clark Sesquicentennial Commission, in addition to the \$250,000 authorized for the latter Commission in the Fourth Deficiency Act, 1933.

Funds transferred, 1934 fiscal year.—A total of \$4,685,609.15 was transferred for part-year operation of those activities which were transferred to the National Park Service under the Executive orders of June 10 and July 28, 1933.

Allotments from no-year appropriations.—In addition to the foregoing, Public Works Administration, Emergency Conservation Work, and Civil Works Administration funds were allotted, as follows:

Public Works, 1934-35

Construction of roads and trails.....	\$26, 884, 144. 00
Construction of physical improvements.....	7, 232, 456. 27
Total.....	34, 116, 600. 27

Emergency Conservation Work

(Procurements from Apr. 22, 1933, to May 31, 1934)

National parks.....	\$4, 641, 281. 00
State parks.....	11, 582, 725. 00
General Land Office.....	32, 470. 00
Territory of Hawaii.....	299, 885. 00
Reclamation Service.....	19, 870. 00
Soil erosion.....	218, 740. 00
Total.....	16, 794, 971. 00

Civil Works Administration

(Period Nov. 28, 1933, to Apr. 28, 1934)

Labor cost.....	\$1, 988, 960. 33
Other than labor cost.....	425, 105. 13
Administrative cost.....	76, 612. 60
Total.....	2, 490, 678. 06

DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1934, amounted to \$285,979.77. The donations were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditures of Federal appropriations. In the 1933 fiscal year cash donations amounted to \$299,902.13.

REVENUES

The revenues received during the fiscal year 1934 amounted to \$731,331.80, as compared with revenue receipts of \$628,182.06 in the 1933 fiscal year.

Direct appropriations, 1935 fiscal year.—For the fiscal year 1935 there has been appropriated \$12,461,513. Of this amount \$6,319,640 was authorized in the Interior Department Appropriation Act, 1935; \$5,325,000 in the Emergency Appropriation Act, 1935, for the construction of roads and trails; and \$816,873 was made available in the District of Columbia Appropriation Act, 1935.

USE OF RADIO TELEPHONES IN NATIONAL PARKS

The highly satisfactory use of radio telephones over a 3-year period in Mount Rainier National Park, for fire protection and emergency administrative purposes, has resulted in the general adoption of this method of communication in many of the other parks.

Last winter Director Fechner approved the expenditure of Emergency Conservation Work funds, amounting to \$15,000, for the purchase of radio equipment for Glacier, Yellowstone, and Great Smoky Mountains National Parks. This equipment is now being installed.

Radio communication was also introduced during the past year in Yosemite, Rocky Mountain, and Grand Teton. Radio communication was particularly effective at Death Valley last winter in connection with the Civilian Conservation Corps camp operations and administration, as no other means of communication was available. Estimates have been made for installations in Sequoia and Grand Canyon National Parks.

The radio sets used generally are of three sizes. The 50-watt headquarters set can transmit voice communication with sufficient strength to insure reception by the small portable sets used on the fire-fighting line. This larger set can likewise receive and amplify the weak signals from the smaller sets. The semiportable sets are rated at 1-watt capacity and weigh approximately 150 pounds. These are used at district ranger stations and at fire look-out stations. The small portable sets weigh approximately 15 pounds and have a normal sending and receiving range of 10 to 20 miles. These can also be used at remotely situated construction camps when no telephone communication is available.

Radio communication is not intended to duplicate the telephone system but is to be used in extending the means of communication to points requiring this service where telephone line installations are prohibitive as to cost of construction and maintenance.

MAINTENANCE OF FEDERAL BUILDINGS

At the close of the fiscal year 98 buildings, aggregating more than 12,000,000 square feet, and 7 memorials in the District of Columbia were being maintained and operated by the buildings branch of the National Park Service. Outside the District, 9 buildings with a total

floor space of over 400,000 square feet were being maintained and operated.

Regular work, supplemented by civil-works and public-works projects and other special jobs, incident to the proper maintenance, operation, and protection of buildings and memorials both within and without the District of Columbia, was performed. The creation of emergency governmental activities and the relocation of a number of bureaus caused a large amount of interior alterations, such as installation of partitions, buzzer systems, special laboratory equipment, and painting.

Forty public-works projects, involving allotments totaling a little more than \$2,000,000, were undertaken. These improvements included repair of the White House and Washington Monument, restoration work on the Lee Mansion in Arlington Cemetery, addition of a seventh floor to the Interior Department Building, and extensive installations of air-cooling and automatic sprinkler systems in the large Federal buildings.

SPACE CONTROL ACTIVITIES

The transfer of the functions of the former Public Buildings Commission to the National Park Service necessitated the creation under the branch of buildings of a Division of Government Space Control. This division maintains records of occupancy and availability of space in Federal or leased buildings, as well as buildings available for leasing for Government use in the District of Columbia.

During the past year 119 leases, involving nearly \$1,500,000, have been made, authorized, or renewed. The space allotments for the new Post Office, Interstate Commerce Commission, Justice, and Labor Buildings have been planned, and 201 moves, costing \$75,800.65, have been made.

While several monumental buildings have been erected in Washington, principally under authority of the Public Buildings Act of May 25, 1926, the Government is still inadequately and improperly housed. If the Federal rent bill maintains its present level, a building containing a million square feet of floor space, almost equal in size to the Department of Commerce Building, could be paid for in 17 years. Such a building would accommodate practically all Federal offices now in rented quarters, and would be a permanent investment of the Government.

As very little relief from congested quarters has been obtained by the use of completed new Federal buildings, and as there still is a justifiable demand for additional buildings for departments not yet adequately housed, it would appear appropriate for the National Park Service to formulate plans for the next step in the general public buildings program for Washington, and make the appropriate recommendations to Congress.

ACCOMMODATIONS FOR THE PUBLIC FURNISHED BY PRIVATE CAPITAL

Services to the public in the way of lodging, meals, transportation, various types of stores, and similar accommodations continued to be operated by private capital either under long-term contract or annual permit, depending upon the amount of capital involved and the type of service rendered.

The increased travel to the national parks, both by rail and by private car, had a very noticeable effect on the volume of business handled by park operators in the western national parks.

During the past fiscal year there was a break in the steady decline that had continued in the operators' business since 1929; and it is gratifying to report that figures available at this time show an increase in such business over last year of slightly in excess of 51 percent. A particularly pleasing phase of this better state of affairs is that the improvement has been general throughout the national parks.

The wisdom of the concessionaire system has been fully demonstrated during the 5 years since 1929, for during that period of depressed conditions the usual high standards of service were furnished by operators of public accommodations, and in many instances at substantially lower rates. Officials of the National Park Service are convinced that under any other policy of operation a break-down of service would have occurred during that losing period, with an inevitable deluge of complaint and criticism from the public.

The plan inaugurated a year ago under which the utility operators, with the approval of the respective park superintendents and the director, were authorized to offer new facilities and to make changes in existing service during the season was continued. The operators took advantage of this opportunity primarily to make experimental changes in service in an effort to determine what the public really wants. Continuation of this policy will have an important influence on the types of new accommodations to be installed and on decisions to be made regarding permanent changes and improvements in existing service.

With the expansion of the National Park Service by transfer of the military and other areas added last year, the number of park operators increased greatly. At the present time there are 85 privately capitalized enterprises operated in areas under the jurisdiction of the Service, varying in size and scope of activities from small stores in isolated areas to large hotels and transportation companies in the larger parks.

Plans for the extension of such facilities into the Great Smoky Mountains National Park and other eastern areas soon to be given national park status were given careful consideration during the past

year. Various agencies have evinced an interest in obtaining preferential right to provide and operate the facilities deemed necessary in those areas and the National Park Service will be ready to submit recommendations regarding operating contracts well in advance of the need of the accommodations to be furnished thereunder.

Under an agreement reached with the National Recovery Administration the operators of public utilities in the national parks were exempt from compliance with the N.R.A. codes, subject to regulations by the Department of the Interior of minimum wage and maximum hours requirements. This agreement was reached upon showing by the park operators that, being subject to the rules and regulations of the Department in all matters pertaining to rate structures, services, and character of facilities furnished under their respective contracts, complete control of their operations should be centralized in that one agency of the Federal Government.

Rules and regulations governing the hours of labor and wages of employees as contemplated under that agreement were approved March 31, 1934.

No general conference of park operators was held in Washington during the past year, but several special conferences were called in the West early in the year for consideration of problems, including the relation of their national-park activities to the National Recovery Administration.

A special meeting of National Park Service officials and park operators was held at Grand Canyon National Park from May 1 to May 5 for the purpose of making a study of the type of service and range of accommodations that should be installed in the national parks, particularly in the public camp grounds, and of the minimum standards to be established for architecture, construction, fire prevention, and sanitation. While the meeting had special reference to the situation at the Grand Canyon, where comprehensive plans are under way for the development of facilities as soon as improved business conditions warrant, the basic policies adopted will be applied to similar problems in all the national parks.

CONCLUSION

In concluding this report, grateful acknowledgments are made of the assistance furnished the National Park Service last year by a great number and wide variety of organizations and individuals.

First of all, appreciation is due the Secretary of the Interior, the Assistant Secretary in charge of national-park policies, and other officers of the Department of the Interior for their ever-ready support of national-park policies and ideals, and their assistance in promoting the welfare of the national-park and monument system; and to Mem-

bers and committees of Congress and officers of the Bureau of the Budget for their sympathetic understanding of national-park affairs.

Bureaus of the Department of the Interior have cooperated fully in furnishing scientific advice and assistance, as have other bureaus throughout the Government service. Civic organizations, the press, universities and colleges, broadcasting companies, railroads and other industrial concerns, and civic-minded individuals are on the long list of those who have furthered the cause of national park use and advancement. The list of those cooperating is too long to print, but all who have assisted have the satisfaction of knowing that they have added to the well-being of America and Americans by promoting national-park protection and use.

Cooperation in the emergency relief program has been mentioned elsewhere. But another word is not amiss here as to the value of that work to our national parks and monuments and the visiting public and as to the gratification of the National Park Service in being one of the Federal agencies privileged to assist in the tremendous relief work.

To the personnel of the Service, field and office, the highest commendation is due. It has met, with efficiency and fine enthusiasm, the complex problems and abnormal amount of work involved in the extraordinary expansion programs of the year.

Attention again is directed to the increased winter use of the national parks. The people of the United States are awakening to the health and recreational value of winter sports, and the national parks of the North and West offer exceptional advantages for such sports. Efforts will be made this fall and winter to stimulate their winter-time use through dissemination of information as to their accessibility and superlative snow conditions.

With plans for expanded use of the national parks and monuments and for improved service in all lines of endeavor, the National Park Service faces the fiscal year 1935 with high hopes and unbounded enthusiasm.

NATIONAL PARKS TABLE 1.—*Holdings acquired for national park and monument purposes*

Parks and monuments	Holdings acquired from July 1, 1933, through June 30, 1934							
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase		Total area acquired in acres	Holdings acquired prior to July 1, 1933, in acres	Total holdings acquired through June 30, 1934, in acres
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park				(1)	1,520.13	1,520.13	12,312.11	13,832.24
Aztec Ruins National Monument							25.88	25.88
Black Canyon of the Gunnison National Monument				(1)	105.00	105.00		105.00
Carlsbad Caverns National Park							441.00	441.00
Chaco Canyon National Monument				(2)	3,832.56	3,832.86		3,832.86
Colonial National Monument	\$85,000.00	\$80,000.00	921.73			921.73	3,322.57	4,244.30
Crater Lake National Park							1.00	1.00
Craters of the Moon National Monument	800.00		80.00			80.00	240.00	320.00
Fredericksburg and Spotsylvania National Historical Park	1,867.93		483.50			483.50	1,929.87	2,413.37
General Grant National Park							20.00	20.00
George Washington Birthplace National Monument							483.70	483.70
Glacier National Park							3,836.86	3,836.86
Grand Canyon National Park							19,228.94	19,228.94
Great Smoky Mountains National Park	944,393.58	506,557.86	65,563.00	(1)	30,805.65	96,368.65	297,719.70	394,088.35
Hawaii National Park							156,800.00	156,800.00
Hot Springs National Park							16.00	16.00
Lassen Volcanic National Park							40.00	40.00
Mesa Verde National Park							350.20	350.20
Muir Woods National Monument							426.43	426.43
Petrified Forest National Monument				(2)	640.00	640.00	3,194.00	3,830.00
Pinnacles National Monument							1,926.27	1,926.27
Rocky Mountain National Park	56,585.00	56,585.00	297.21			297.21	4,798.93	5,096.14
Scotts Bluff National Monument							162.08	162.08
Sequoia National Park							3,294.25	3,294.25
Wind Cave National Park							100.77	100.77
Yellowstone National Park	3,250.00	3,250.00	851.99			851.99	2,414.08	3,266.07
Yosemite National Park				(1)	5.03	5.03	27,462.89	30,547.48
Zion National Park							1,556.36	1,561.39
Yucca House National Monument							9.60	9.60
Total	1,091,896.51	646,392.86	68,197.43		36,908.37	105,106.10	542,113.49	650,300.18

¹ Donation.² Exchange.

NATIONAL PARKS TABLE 2.—*Automobile and motorcycle licenses issued during seasons 1930-34*

Name of park ¹	1930		1931		1932		1933		1934	
	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles
Crater Lake.....	37,595	10	35,716	51	29,637	-----	19,924	-----	18,521	-----
General Grant.....	7,199	-----	7,397	-----	5,900	-----	6,199	-----	7,992	-----
Glacier.....	10,498	7	11,362	-----	10,712	11	8,955	10	12,146	18
Grand Canyon.....	33,780	-----	36,797	-----	32,651	-----	30,104	-----	28,721	-----
Lassen Volcanic ²	-----	-----	-----	-----	4,803	3	4,924	9	6,859	7
Mesa Verde.....	4,599	-----	4,863	-----	4,382	-----	4,262	-----	3,947	-----
Mount Rainier.....	35,498	28	41,217	16	44,719	-----	31,903	-----	32,095	-----
Sequoia ³	20,998	-----	21,802	-----	18,304	-----	17,045	-----	17,401	-----
Yellowstone.....	63,853	187	56,401	176	52,597	155	38,580	46	44,886	170
Yosemite.....	81,365	186	76,678	175	67,482	129	61,742	118	64,055	124
Zion.....	10,284	-----	15,754	-----	12,967	-----	12,194	-----	14,352	-----
Total.....	305,669	418	307,987	418	284,154	298	235,832	183	250,975	319

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

Licenses not required in certain parks because of small road mileage or unimproved condition of roads (see footnote 1). Licenses also not required for travel on unimproved roads in other parks. No charge for license issued for operating cars on official business.

NATIONAL PARKS TABLE 3.—*Receipts collected from automobiles and motorcycles during seasons 1930-34*

Name of park ¹	1930	1931	1932	1933	1934
Crater Lake.....	\$37,623.00	\$35,803.00	\$29,687.00	\$19,924.00	\$18,521.00
General Grant.....	3,599.50	3,698.50	2,950.00	3,099.50	3,996.00
Glacier.....	10,506.00	11,362.00	11,092.00	8,965.00	12,164.00
Grand Canyon.....	33,988.00	36,950.00	32,764.00	30,104.00	28,721.00
Lassen Volcanic ²	-----	-----	5,778.50	4,928.50	6,862.50
Mesa Verde.....	4,644.00	4,917.00	4,396.00	4,262.00	3,947.00
Mount Rainier.....	35,526.00	41,233.00	44,719.00	31,903.00	32,095.00
Sequoia ³	20,998.00	21,802.00	18,304.00	17,045.00	17,401.00
Yellowstone.....	192,218.00	169,379.00	156,537.00	115,786.00	134,828.00
Yosemite.....	162,784.00	153,531.00	135,831.00	123,602.00	128,234.00
Zion.....	7,521.00	15,400.00	12,976.00	12,194.00	14,352.00
Total.....	509,407.50	494,075.50	455,034.50	371,813.00	401,121.50

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² No license required prior to 1932 fiscal year.

³ License required only for Giant Forest Road.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years*¹

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1928	\$37,940.00	\$37,376.99	
1929	39,000.00	40,014.00	
1929 (deficiency)	1,355.00		
1930	52,600.00	48,701.52	
1931	59,900.00	56,984.42	
1932	61,600.00	59,892.14	
1933	59,400.00	57,602.08	\$10.00
1934	55,000.00	37,644.00	220.06
1935	41,470.00		
Bryce Canyon:			
1930	26,100.00	21,580.01	
1931	13,700.00	13,700.00	
1932	20,000.00	19,257.50	
1933	14,800.00	12,455.43	
1934	13,790.00	7,211.00	
1935	10,490.00		
Carlsbad Caverns National Park:			
1928	30,000.00	28,492.84	55,682.00
1929	70,000.00	63,490.00	
1929 (deficiency)	260.00		
1930	100,000.00	103,271.01	136,241.78
1931	165,600.00	124,220.75	143,779.55
1932	150,100.00	130,162.62	113,677.43
1933	128,800.00	135,687.63	77,236.57
1934	68,330.00	49,356.00	89,730.54
1935	52,330.00		
Crater Lake:			
1928	63,590.00	62,382.53	22,927.69
1929	47,100.00	61,464.00	
1929 (deficiency)	850.00		
1930	59,800.00	67,938.75	
1930 (deficiency)	12,000.00		
1931	73,300.00	73,551.96	35,843.15
1932	106,900.00	106,753.64	29,687.00
1933	90,000.00	86,554.37	19,924.00
1934	63,479.00	53,838.00	18,937.35
1935	49,965.00		
General Grant:			
1928	13,650.00	13,529.26	3,488.90
1929	15,650.00	15,802.00	
1929 (deficiency)	500.00		
1930	15,650.00	15,448.14	3,868.28
1931	15,860.00	15,841.07	3,989.95
1932	21,900.00	21,881.86	3,973.22
1933	21,900.00	20,913.85	3,437.16
1934	15,000.00	10,771.00	4,459.92
1935	11,750.00		
Glacier:			
1928	163,300.00	162,525.28	14,652.59
1929	188,200.00	191,061.00	
1929 (deficiency)	5,065.00		
1930	219,400.00	215,726.91	22,146.16
1931	227,000.00	223,956.32	
1931 (deficiency)	9,550.00		
1932	256,500.00	246,002.11	17,495.56
1933	226,200.00	224,744.51	12,006.64
1934	201,803.00	143,724.00	16,235.36
1935	153,435.00		
Grand Canyon:			
1928	128,760.00	128,268.33	46,097.43
1929	169,000.00	151,813.00	
1929 (deficiency)	3,540.00		
1930	145,000.00	141,389.56	55,684.46
1931	153,600.00	171,670.11	51,497.05
1932	172,200.00	168,106.43	40,221.18
1933	150,000.00	142,656.15	32,933.93
1934	135,890.00	91,520.00	31,139.42
1935	102,400.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years ¹—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Grand Teton:			
1929.....			\$25. 00
1930.....			70. 00
1931.....	\$30,700. 00	\$29,048. 47	20. 00
1932.....	76,750. 00	² 73,180. 80	73. 80
1933.....	29,900. 00	26,243. 06	45. 00
1934.....	20,000. 00	12,650. 00	68. 22
1935.....	15,620. 00		
Great Smoky Mountains:			
1930-31 (deficiency).....	30,000. 00	25,193. 31	76. 00
1932.....	30,000. 00	² 29,682. 77	5,220. 55
1933.....	30,000. 00	27,959. 52	5,140. 69
1934.....	28,430. 00	17,024. 00	4,795. 00
1935.....	22,270. 00		
Hawaii:			
1928.....	18,250. 00	18,119. 10	1,450. 00
1929.....	21,500. 00	21,070. 00	1,477. 00
1929 (deficiency).....	785. 00		
1930.....	27,400. 00	25,700. 05	1,532. 52
1931.....	35,800. 00	35,439. 55	1,500. 00
1932.....	54,600. 00	54,594. 06	1,493. 41
1933.....	51,100. 00	50,095. 20	482. 46
1934.....	48,079. 00	32,658. 00	475. 00
1935.....	37,125. 00		
Hot Springs:			
1928.....	69,800. 00	67,433. 19	47,695. 50
1929.....	68,000. 00	71,970. 00	47,930. 90
1929 (deficiency).....	6,320. 00		
1930.....	70,900. 00	69,173. 28	47,931. 33
1931.....	218,500. 00	194,760. 18	50,467. 80
1932.....	89,300. 00	² 86,110. 72	43,243. 22
1933.....	87,700. 00	82,359. 03	38,263. 90
1934.....	82,680. 00	58,979. 00	30,456. 00
1935.....	64,330. 00		
Lassen Volcanic:			
1928.....	15,625. 00	15,448. 52	167. 84
1929.....	22,400. 00	22,688. 00	34. 36
1929 (deficiency).....	460. 00		
1930.....	25,300. 00	25,061. 16	3,089. 55
1931.....	30,500. 00	29,007. 20	51. 59
1932.....	50,300. 00	² 49,774. 20	5,778. 50
1933.....	45,100. 00	43,310. 99	4,980. 96
1934.....	28,334. 00	20,003. 00	6,953. 94
1935.....	22,635. 00		
Mesa Verde:			
1928.....	50,750. 00	48,343. 59	3,342. 80
1929.....	83,000. 00	³ 78,134. 00	4,719. 00
1929 (deficiency).....	1,115. 00		
1930.....	57,000. 00	53,910. 66	4,870. 62
1931.....	96,800. 00	⁴ 95,799. 70	5,411. 27
1932.....	57,300. 00	² 55,724. 49	5,011. 75
1932 (deficiency).....	22,000. 00	⁴ 91,693. 26	4,750. 50
1933.....	72,900. 00		
1934.....	52,509. 00	39,654. 00	4,224. 50
1935.....	41,535. 00		
Mount McKinley:			
1928.....	22,000. 00	21,314. 12	63. 04
1929.....	35,900. 00	³ 36,165. 00	1. 00
1929 (deficiency).....	740. 00		
1930.....	40,000. 00	37,680. 26	213. 18
1931.....	46,700. 00	42,686. 45	292. 00
1932.....	31,100. 00	28,157. 21	129. 66
1933.....	35,600. 00	32,165. 49	25. 00
1934.....	28,480. 00	20,642. 00	25. 00
1935.....	22,270. 00		
Mount Rainier:			
1928.....	108,000. 00	105,447. 74	32,495. 50
1929.....	141,000. 00	³ 141,285. 00	39,233. 17
1929 (deficiency).....	3,370. 00		
1929-30 (deficiency).....	2,500. 00	125,214. 00	41,530. 31
1930.....	122,600. 00		
1931.....	180,900. 00	174,823. 33	46,034. 89
1932.....	195,000. 00	² 263,233. 48	48,793. 27
1931-32 (deficiency).....	71,000. 00		
1933.....	227,100. 00	214,501. 02	33,506. 96
1934.....	143,884. 00	103,795. 00	34,158. 65
1935.....	109,505. 00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years ¹—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
National Capital Parks:			
1934.....	\$787,000.00	\$778,839.00	⁷ \$24,086.97
1935.....	816,873.00		
Platt:			
1928.....	13,050.00	12,991.87	77.16
1929.....	18,000.00	19,053.00	33.05
1929 (deficiency).....	1,080.00		
1930.....	16,200.00	16,178.70	
1931.....	18,500.00	18,269.14	
1932.....	35,900.00	² 35,506.83	
1933.....	31,600.00	30,333.10	
1934.....	28,520.00	16,382.00	
1935.....	19,150.00		
Rocky Mountain:			
1928.....	97,620.00	95,612.07	924.12
1929.....	95,500.00	³ 95,230.00	1,537.07
1929 (deficiency).....	2,380.00		
1930.....	96,000.00	94,871.34	4,471.24
1931.....	105,950.00	104,880.57	448.45
1932.....	118,800.00	² 117,909.55	749.58
1933.....	114,300.00	111,361.48	1,046.41
1934.....	98,007.00	75,305.00	409.29
1935.....	75,145.00		
Sequoia:			
1928.....	109,000.00	108,863.10	35,105.83
1929.....	113,000.00	³ 114,626.00	30,753.00
1929 (deficiency).....	3,440.00		
1930.....	130,000.00	130,056.49	33,934.54
1931.....	113,100.00	111,513.95	35,694.49
1932.....	156,900.00	156,713.93	33,010.38
1933.....	131,800.00	129,146.15	30,189.77
1934.....	113,317.00	86,483.00	34,164.96
1935.....	88,475.00		
Shenandoah (proposed):			
1934.....	⁶ 80,000.00		
1935.....	27,680.00		
Wind Cave:			
1928.....	10,850.00	11,500.00	12,725.50
1929.....	11,000.00	11,744.00	13,178.17
1929 (deficiency).....	760.00		
1930.....	13,500.00	13,442.51	16,715.01
1931.....	54,900.00	46,271.94	11,968.43
1932.....	25,200.00	² 68,074.68	7,258.68
1931-32 (deficiency).....	50,000.00		
1933.....	20,600.00	20,345.64	5,056.19
1934.....	18,160.00	13,386.00	4,239.97
1935.....	14,020.00		
Yellowstone:			
1928.....	400,000.00	³ 399,150.00	251,663.11
1929.....	434,000.00	³ 443,230.00	289,388.95
1929 (deficiency).....	12,230.00		
1930.....	453,000.00	463,306.47	317,238.17
1930 (deficiency).....	17,000.00	500,026.39	259,723.33
1931.....	501,275.00		
1932.....	560,800.00	² 536,739.83	228,644.39
1933.....	530,800.00	497,681.85	149,853.87
1934.....	466,309.00	323,592.00	164,699.05
1935.....	350,265.00		
Yosemite:			
1928.....	301,000.00	⁴ 257,363.73	276,438.20
1928 (deficiency).....	15,000.00		
1929.....	387,250.00	³ 449,159.00	237,166.90
1929 (deficiency).....	14,385.00		
1930.....	412,360.00	⁴ 390,204.38	280,355.45
1930 (deficiency).....	5,381.00		
1931.....	510,100.00	574,302.64	260,805.28
1931 (deficiency).....	32,500.00		
1932.....	558,600.00	² 535,376.25	222,629.17
1933.....	401,200.00	389,523.19	196,319.94
1934.....	335,309.00	205,227.00	221,960.83
1935.....	251,845.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years* ¹—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Zion:			
1928	\$30,900.00	\$30,737.69	\$3,106.50
1929	38,000.00	40,569.00	3,576.50
1929 (deficiency)	3,295.00		
1930	38,300.00	³ 42,290.11	7,724.01
1931	33,200.00	³ 32,589.60	15,500.50
1932	54,100.00	² 53,145.65	13,067.30
1933	46,600.00	45,451.53	12,194.00
1934	47,440.00	32,646.00	14,539.35
1935	35,940.00		
George Washington B.P. National Monument:			
1930 (deficiency)	996.18	987.71	
1930-31 (deficiency)	80,000.00	78,782.34	
1931	2,500.00		
1932	26,500.00	² 26,050.83	1.00
1933	25,800.00	22,661.61	20.00
1934	21,250.00	11,468.00	
Colonial National Monument:			
1931-32 (deficiency)	135,000.00	² 132,648.99	299.95
1933	72,000.00	53,615.41	504.92
1934	52,030.00	38,711.00	483.34
Protection of National Monuments:			
1928	25,000.00	24,042.56	132.00
1929	35,000.00	35,951.00	97.00
1929 (deficiency)	1,225.00		
1930	46,000.00	⁴ 42,634.76	100.00
1931	83,900.00	71,598.75	269.60
1931 (deficiency)	3,000.00		
1932	165,400.00	⁴ 147,585.89	195.19
1933	93,800.00	⁴ 86,978.64	252.05
1934	89,060.00	57,457.00	185.03
1935	82,760.00		
National Historical Parks and Monuments:			
1935	77,350.00		
National Military Parks, Battlefields, and Cemeteries:			
1934	229,883.00	135,464.00	306.67
1935	160,030.00		
National Military Monuments:			
1934	36,223.00	25,658.00	575.00
1935	33,770.00		
National Park Service:			
1928	57,100.00	57,047.56	20.10
1929	70,200.00	³ 75,714.00	
1929 (deficiency)	4,660.00		
1930	80,830.00	81,864.36	.25
1931	117,000.00	115,859.20	
1932	167,400.00	165,299.20	
1933	174,620.00	174,547.94	1.14
1934	160,000.00	143,069.00	10.00
1935	148,390.00		
Public Buildings and Grounds:			
1934	3,479,193.00	3,396,605.00	23,774.23
1935	4,078,590.00		
Arlington Memorial Bridge:			
1934	198,000.00	57,025.00	
Addition to Executive Office building:			
1935 (deficiency)	325,000.00		
Fighting forest fires:			
1922	25,000.00	9,618.30	
1923	25,000.00	17,764.16	
1924	25,000.00	6,526.02	
1925	20,000.00	20,000.00	
General expenses, National Park Service:			
1931	25,000.00	24,993.02	
1932	35,100.00	31,904.58	
1933	37,000.00	33,914.87	
1934	25,000.00	24,585.00	
1935	24,500.00		
Emergency reconstruction: 1925	20,000.00	17,009.15	
Forest protection and fire prevention:			
1931	96,850.00	95,856.95	
1932	170,000.00	³ 167,247.75	
1933	140,000.00	132,491.82	
1934	147,000.00	108,580.00	
1935	69,600.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years*¹—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Emergency reconstruction and fighting forest fires:			
1926.....	\$40,000.00	} \$80,000.00	-----
1926 (deficiency).....	40,000.00		-----
1927.....	40,000.00	40,000.00	-----
1927 (deficiency).....	235,000.00	228,647.83	-----
1928.....	40,000.00	26,865.46	-----
1929 (deficiency).....	29,000.00	⁴ 40,138.26	-----
1930.....	20,000.00	} 180,300.17	-----
1930 (deficiency).....	180,000.00		-----
1931.....	50,000.00	40,481.49	-----
1932.....	50,000.00	} 169,950.35	-----
1932 (deficiency).....	55,000.00		-----
1933.....	50,000.00	⁴ 57,228.83	-----
1934.....	50,000.00	} 35,407.00	-----
1934 (deficiency).....	100,000.00		-----
1935 (deficiency).....	25,000.00		-----
Construction of roads and trails:			
1925 (deficiency).....	1,000,000.00	1,000,000.00	-----
1926.....	1,500,000.00	1,500,000.00	-----
1927.....	2,000,000.00	2,000,000.00	-----
1928.....	2,000,000.00	2,000,000.00	-----
1928 (deficiency).....	1,000,000.00	1,000,000.00	-----
1929.....	2,500,000.00	2,500,000.00	-----
1930.....	5,000,000.00	5,000,000.00	-----
1931.....	5,000,000.00	} 7,500,000.00	-----
1931 (deficiency).....	2,500,000.00		-----
1932.....	5,000,000.00	5,000,000.00	-----
1933.....	4,500,000.00	4,500,000.00	-----
1934.....	2,435,700.00	1,477,200.00	-----
Emergency construction, roads and trails:			
1931 (deficiency).....	2,078,800.00	2,078,800.00	-----
1933.....	3,000,000.00	3,000,000.00	-----
1935 (deficiency).....	5,000,000.00		-----
Insect control:			
1925-26 (deficiency).....	25,000.00	24,945.24	-----
1927.....	20,000.00	19,828.96	-----
1928.....	7,500.00	7,379.35	-----
Southern Appalachian:			
1925-26 (deficiency).....	20,000.00	12,453.27	-----
1927.....	(⁴)	7,252.21	-----
1928.....	5,000.00	⁴ 3,887.13	-----
1929.....	4,500.00	⁴ 3,945.07	-----
1930.....	3,000.00	⁴ 3,415.75	-----
1931.....	3,000.00	⁴ 4,172.45	-----
Purchase of lands:			
1928.....	50,000.00	13,925.00	-----
1929.....	50,000.00	1,383.00	-----
1930.....	250,000.00	17,233.93	-----
1931.....	1,750,000.00	⁵ 1,983,718.06	-----
1932.....	1,000,000.00	⁴ 711,688.33	-----
1933.....		⁵ 238,396.19	-----
Extension of winter-feed facilities:			
1930.....	75,000.00	7,612.50	-----
1931.....	75,000.00	10,265.00	-----
1932.....		⁶ 12,022.50	-----
1933.....		⁶ 477.50	-----
Purchase of lands Colonial National Monument:			
1931-32 (deficiency).....	500,000.00	500,000.00	-----
Public-works projects, roads and trails:			
1933-35.....	26,884,144.00	4,103,107.00	-----
Public-works projects, physical improvements:			
1933-35.....	7,232,456.00	1,651,423.00	-----
Emergency conservation work:			
1933-35 (allotments program).....	16,794,971.00	11,799,459.00	-----
Civil works, 1933-35.....	2,490,678.00	2,490,678.00	-----

¹ For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354-358, and for 1918-27 see 1930 Annual Report, pp. 66-72.² Appropriation decreased by transfers to emergency reconstruction and fighting forest fires under authority contained in the appropriation act. (See table 18.)³ Appropriation augmented by transfers from other appropriations under 10-percent clause.⁴ Reappropriated items. (See table 14.)⁵ Available until expended.⁶ Funds lapsed. Park not established in specified time.⁷ Credited to the miscellaneous receipts in the District of Columbia.

NATIONAL PARKS TABLE 5.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reapropriated for fiscal year	Park	Amount	Purpose
1928.....	1929	Yosemite.....	\$35,000.00	Hospital building.
1928.....	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928.....	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929.....	1930	Yosemite.....	8,661.78	Construction of water-supply and camp-ground facilities.
1929.....	1930	Carlsbad Caverns.....	4,950.00	Superintendent's residence.
1929.....	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929.....	1931	Grand Canyon.....	20,000.00	Hospital building.
1930.....	1931	Acadia.....	2,850.00	Equipment storage building.
1930.....	1931	Crater Lake.....	1,091.06	Ranger station.
1930.....	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930.....	1931	Yosemite.....	32,662.70	Physical improvements.
1930.....	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930.....	1931	Southern Appalachian.....	1,246.80	To remain available; general.
1930.....	1931	Glacier.....	9,550.00	One-third of cost of constructing a telephone line.
1931.....	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931.....	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931.....	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932.....	1933	Carlsbad Caverns.....	13,000.00	Electric system, extension and improvement.
1932.....	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.
1933.....	1934	Emergency reconstruction and fighting forest fires.	9,143.93	To remain available; general.

NATIONAL PARKS TABLE 6.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917¹ to 1934, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department.....	\$537,366.67	
	War Department.....	247,200.00	
1918	Interior Department.....	530,680.00	\$784,566.67
	War Department.....	217,500.00	
1919	Interior Department.....	963,105.00	748,180.00
	War Department.....	50,000.00	
		50,000.00	
1920		1,013,105.00	196,678.03
1921		907,070.76	316,877.96
1922		1,058,969.16	396,928.27
1923		1,433,220.00	432,964.89
1924		1,446,520.00	513,706.36
1925		1,892,601.00	663,886.32
1926		3,027,657.00	670,920.98
1927		3,258,409.00	826,454.17
1928		3,698,920.00	703,849.60
1929		4,889,685.00	808,255.81
1930		4,754,015.00	849,272.95
1931		7,813,817.18	1,015,740.56
1932		12,113,435.00	940,364.79
1933		12,831,250.00	820,654.19
1933-35		10,640,620.00	628,182.06
1934		53,402,249.00	
1935		10,983,089.00	731,331.80
		12,461,513.00	

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 7.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686.....	1925	¹ \$1,000,000		\$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179.....	1926	1,500,000	² \$1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491.....	1927	2,000,000	² 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966.....	1928	2,000,000	² 2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19.....		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237.....	1929	2,500,000	² 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601.....	1930		² 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319.....		5,500,000		
Act Dec. 20, 1930; emergency construction.....	1931	1,500,000	² 2,500,000	
Emergency construction funds transferred by the President.....		578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115.....	1932	5,000,000	² 2,850,000	
Second Deficiency Act 1931; Mar. 4, 1931.....		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127.....	1933	4,500,000	³ 2,500,000	7,150,000
Emergency construction and relief.....		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853.....	1934	2,435,700		64,300
Emergency construction.....	1935	5,000,000		5,000,000
Total appropriated.....		44,514,500		
Total program to date.....				44,514,500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

NATIONAL PARKS TABLE 8.—*Forest-fire statistics, calendar year 1933*

Park	Classification of fires				Location of origin of fires				Area burned inside parks (to nearest whole acre)				Timber destroyed inside parks			Costs of fire suppression (to nearest whole dollar)						Grand total
	A ¼ acre or less	B Between ¼ and 10 acres	C 10 acres or over	Total All classes A, B, and C	Inside parks		Outside parks		Timber	Brush	Grass	Total	Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs proportionated	Total	Salaries of park employees	
					On Government lands	On private lands	Enter park	Confining to outside areas														
Acadia	Number	Number	Number	Number	Number	Number	Number	Number	Acres	Acres	Acres	Acres	M.b.f.	M.b.f.	M.b.f.							
Bryce Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carlsbad Caverns	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crater Lake	7	1	0	8	7	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0
General Grant	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Glacier	32	3	2	37	29	7	1	1	31	0	0	31	4	0	4	\$2,720	\$8,347	\$1,570	\$20	\$20	\$15	\$35
Grand Canyon	8	3	1	12	12	0	0	0	21	0	0	21	19	0	19	34	61	16	16	14,315	228	114,543
Grand Teton	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Great Smoky Mountains	5	14	19	38	11	9	6	12	2,583	5	2,588	0	4	0	4	265	23	0	0	288	168	456
Hawaii	2	3	1	6	8	0	1	1	26	0	0	0	0	0	0	35	0	0	0	35	0	35
Hot Springs	4	3	1	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lassen Volcanic	9	2	1	12	10	0	1	1	1	24	0	25	0	0	0	4	11	0	0	15	0	15
Mesa Verde	1	1	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mount McKinley	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mount Rainier	9	2	2	13	9	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Platt	2	3	2	7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain	6	2	0	8	4	1	0	0	3	4	0	4	24	0	24	206	9	1	3	4	21	21
Sequoia	35	4	5	44	37	4	1	3	4	0	0	4	0	0	0	0	0	0	0	0	0	0
Wind Cave	1	1	1	3	1	0	0	0	6	10	16	0	0	0	0	5	0	0	0	5	5	10
Yellowstone	24	9	6	39	38	1	1	1	1,979	151	2,187	2,493	2,493	0	2,493	3,129	1,620	676	1,308	6,733	1,056	7,789
Yosemite	27	7	3	37	56	1	0	0	120	40	160	27	27	0	27	10	14	45	36	105	171	276
Zion	1	1	0	2	1	1	0	0	0	0	0	0	0	0	0	2	2	0	0	4	4	4
Colonial Monument	0	6	1	7	4	1	0	0	1	4	10	15	.5	.5	1	0	0	5	16	21	34	55
Devils Tower	1	1	0	2	1	1	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	3
Muir Woods	1	1	1	3	1	0	0	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0
Bandelier	4	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	176	59	42	277	219	12	17	29	4,777	219	116	5,112	2,567.5	4.5	2,572	6,413	10,088	2,296	3,077	21,874	2,085	23,959

¹ Glacier—Additional Emergency Protection Service amounted to \$151; expense of \$14,543 incurred largely in suppression of 2,400-acre fire immediately outside the boundary of the park.

M.b.f. = Thousand board feet. Figures on timber destroyed are estimates and not actual cruises.

NATIONAL PARKS TABLE 8.—*Forest-fire statistics, calendar year 1933*—Continued

Park	Causes of fires										Classification of fires according to cost of suppression (includes only those fires which burned inside park boundaries)									
	Lightning	Camp fires	Smokers	Debris burning	Incon- dinary	Lumber- ing	Rail- roads	Mis- cella- neous	Total man- caused	Grand total	\$25 and under	\$26 to \$50	\$51 to \$100	\$101 to \$200	\$201 to \$500	\$501 to \$1,000	\$1,001 to \$2,000	\$2,001 to \$5,000	Over \$5,000	Total
Acadia.....	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber	Num- ber
Bryce Canyon.....	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	0
Carlsbad Caverns.....	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	0
Crater Lake.....	3	---	4	---	---	---	---	1	5	8	7	---	---	---	---	---	---	---	---	7
General Grant.....	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	0
Glacier.....	21	3	5	7	---	---	---	1	16	37	30	---	---	---	---	---	---	---	---	36
Grand Canyon.....	10	---	1	1	---	---	---	---	2	12	11	1	---	1	2	---	---	---	---	12
Grand Teton.....	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	0
Great Smoky Mountains.....	---	---	4	3	28	---	1	---	38	38	19	2	1	3	1	---	---	---	---	26
Hawaii.....	---	---	---	---	---	---	---	---	2	2	---	---	---	---	---	---	---	---	---	1
Hot Springs.....	---	---	---	1	---	---	---	---	8	8	8	---	---	---	---	---	---	---	---	8
Lassen Volcanic.....	7	1	2	1	---	---	---	---	4	11	8	2	---	---	---	---	---	---	---	10
Mesa Verde.....	---	1	---	1	---	---	---	---	2	2	---	---	---	---	---	---	---	---	---	2
Mount McKinley.....	---	---	---	---	---	---	---	---	---	0	---	---	---	---	---	---	---	---	---	0
Mount Rainier.....	---	9	---	---	---	---	---	---	9	9	9	---	---	---	---	---	---	---	---	9
Platt.....	---	7	---	---	---	---	---	---	7	7	6	1	---	---	---	---	---	---	---	7
Rocky Mountain.....	1	3	2	5	---	---	---	2	7	7	---	---	---	---	---	---	---	---	---	5
Sequoia.....	22	4	12	1	2	1	2	---	22	44	36	1	---	---	---	---	---	---	---	37
Wind Cave.....	1	---	---	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1
Yellowstone.....	20	2	11	5	---	---	---	1	19	39	23	5	4	---	3	1	---	---	---	39
Yosemite.....	10	3	16	3	---	---	---	5	27	37	34	3	---	---	---	---	---	---	---	37
Zion.....	---	---	---	---	1	---	---	---	1	1	1	---	---	---	---	---	---	---	---	1
Colonial Monument.....	---	---	6	---	---	---	---	---	6	7	5	---	---	---	---	---	---	---	---	5
Devils Tower.....	1	---	1	---	---	---	---	---	1	1	1	---	---	---	---	---	---	---	---	1
Muir Woods.....	---	---	---	1	---	---	---	---	1	1	---	---	---	---	---	---	---	---	---	1
Bandelier.....	2	2	---	---	---	---	---	---	2	4	4	---	---	---	---	---	---	---	---	4
Total.....	98	28	78	24	31	1	3	14	179	277	211	11	11	4	5	3	0	3	0	248

NATIONAL PARKS TABLE 9.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, April 1911 to June 30, 1934

		Total work accomplished from start of program to June 30, 1934		
Item	Unit	National parks and monu- ments	State parks	Com- bined total national parks and State parks
NEW CONSTRUCTION				
Telephone lines.....	Miles.....	293	406	699
Firebreaks.....	do.....	198	632	830
Reduction of fire hazards.....	Acres.....	32, 552	37, 936	70, 488
Roadside clearing or clean-up, fire prevention.....	Miles.....	1, 170	592	1, 762
Trailside clearing or clean-up, fire prevention.....	do.....	317	603	920
Lookout:				
Houses.....	Number.....	None	30	30
Towers.....	do.....	5	38	43
Fighting forest fires.....	Man-days.....	22, 521	28, 568	51, 089
Fire:				
Presuppression.....	do.....	7, 518	None	7, 518
Prevention.....	do.....	1, 122	None	1, 122
General clean-up other than fire prevention.....	Acres.....	14, 186	21, 153	35, 339
Forest stand improvement.....	do.....	3, 615	28, 991	32, 606
Truck trails.....	Miles.....	687	670	1, 357
Minor roads.....	do.....	12	236	248
Horse trails.....	do.....	337	405	742
Foot trails.....	do.....	146	827	973
Dwellings at—				
Permanent stations.....	Number.....	74	None	74
Temporary or seasonal stations.....	do.....	45	None	45
Tool houses and boxes.....	do.....	182	806	988
Barns.....	do.....	53	None	53
Office buildings.....	do.....	31	None	31
Public camp ground:				
Clearing.....	Acres.....	2, 539	5, 704	8, 243
Buildings.....	Number.....	10	652	662
Latrines.....	do.....	73	497	570
Water systems.....	Feet.....	34, 761	87, 025	121, 786
Waste disposal.....	do.....	2, 025	21, 813	23, 838
Other public camp ground facilities.....	Number.....	1, 376	3, 909	5, 285
Other structures.....	do.....	236	1, 078	1, 314
Fences:				
Other than range.....	Miles.....	45	236	281
Range.....	do.....	64	None	64
Water systems:				
(a) Storage facilities.....	Thousand gallons.....	31	11, 973	12, 004
(b) Pipe lines.....	Feet.....	36, 969	297, 225	334, 194
(c) Wells and water holes.....	Number.....	19	461	480
Spring or well development for livestock.....	do.....	4	None	4
Reservoirs, water for livestock.....	do.....	9	None	9
Planting, forestation.....	Acres.....	1, 537	13, 160	14, 697
Nursery.....	Man-days.....	6, 019	16, 691	22, 710
Experimental plots.....	Number.....	7	None	7
Range revegetation.....	Acres.....	174	None	174
Seed collection:				
(a) Conifers (cones).....	Bushels.....	31	203	234
(b) Hardwoods and other.....	Pounds.....	1, 569	4, 750	6, 319
Insect pest control:				
(a) Tree.....	Acres.....	171, 412	85, 511	256, 923
(b) Other.....	do.....	3, 673	11, 671	15, 344
Rodent control.....	do.....	None	8, 529	8, 529
Tree- and plant-disease control.....	do.....	22, 169	25, 522	47, 691
Eradication of poisonous and other plants.....	do.....	984	4, 849	5, 833
Surveys:				
(a) Linear.....	Miles.....	13, 470	2, 502	15, 972
(b) Topographic.....	Acres.....	18, 846	59, 634	78, 480
(c) Timber estimating, forest type, range, special use, etc.....	do.....	549, 834	None	549, 834
(d) Model or relief maps.....	Square feet.....	75	None	75
Erosion control:				
(a) Dams.....	Number.....	1, 381	None	1, 381
(b) Land benefited.....	Acres.....	50, 683	22, 417	73, 100
(c) Bank protection.....	Square yards.....	301, 540	869, 150	1, 170, 690

NATIONAL PARKS TABLE 9.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, April 1911 to June 30, 1934—Continued

Item	Unit	Total work accomplished from start of program to June 30, 1934		
		National parks and monu- ments	State parks	Com- bined total national parks and State parks
NEW CONSTRUCTION—continued				
Footbridges.....	Number.....	73	536	609
Horse bridges.....	do.....	63	87	150
Vehicle bridges.....	do.....	173	331	504
Stock bridges, also cattle guards and gates.....	do.....	2	None	2
Water improvement:				
(a) Lake, pond, or beach.....	Acres.....	14	12, 104	12, 118
(b) Stream.....	Miles.....	58	249	307
(c) Restocking fish.....	Number.....	373, 000	None	373, 000
Ponds for fish and birds.....	do.....	90	None	90
Dams, recreational.....	do.....	3	810	813
Corrals.....	do.....	13	None	13
Flood control:				
(a) Line and grade (surveys).....	Linear feet.....	170, 303	None	170, 303
(d) River bank (clearing).....	Square yards.....	5, 000	18, 042, 119	18, 047, 119
(e) Channel (clearing).....	Linear yards.....	29, 660	88, 677	118, 337
(u) Cribbing, includes riprap filling.....	Linear feet.....	3, 580	None	3, 580
Clearing, dam site.....	Square yards.....	None	74, 051	74, 051
Landscaping:				
(a) Unclassified.....	Acres.....	5, 489	11, 178	16, 667
(b) Fine grading (road slopes, parking areas, etc.).	Cubic yards.....	146, 274	None	146, 274
(c) Soil preparation.....	Square yards.....	222, 580	None	222, 580
(d) Seeding or sodding.....	Acres.....	227	None	227
(e) Moving and planting trees or shrubs.....	Number.....	162, 272	None	162, 272
(f) Tree surgery.....	Man-days.....	3, 126	None	3, 126
Masonry guard rails.....	Cubic yards.....	486	376	862

GEOLOGICAL SURVEY

WALTER CURRAN MENDENHALL, Director

From the point of view of the geologists of this continent, the important event of the year was the meeting in Washington, in July, of the sixteenth session of the International Geological Congress. The only other session held in the United States was the fifth, in 1891.

The technical sessions were held during the week July 22-29. They were preceded and followed by excursions to points of geologic interest east and west, two of them crossing the continent to the Pacific and back. One hundred interesting and valuable papers dealing with the geology and mineral resources of various parts of the world were presented and discussed. Nine of these papers were presented by members of the Survey staff. Leading geologists from all the principal nations were present and participated, 34 foreign countries being represented by official delegates. The total enrollment included 1,181 scientists and scientific institutions, about one-third of them from abroad. The various geologic institutions and individual geologists of the United States shared in the duties of host, served as officers of the Congress here and as guides on the geologic excursions, and participated in the preparation of the guidebooks for these excursions. In all these activities the staff of the Survey participated. Two principal publications arising out of the activities of the Congress are in course of publication—the report containing the proceedings of the Congress and a volume on the “Copper resources of the world.”

The Geological Survey hastened the issue of its new geologic map of the United States, which had been in preparation for a number of years, so that it appeared in time for the meeting.

The year has been one of adaptation to altered conditions of government. The new agencies and services have made many and varied demands upon the facilities and the staffs of the Survey. Its specialists and their specialized knowledge in problems of water supply, mapping, geology, engineering, and land classification have been in embarrassing demand. Difficult adjustments were necessary at the beginning of the year. Economy legislation had reduced regular appropriations to a point where many separations from the service were necessary and many important projects had to be suspended. Later the Public Works Administration allocated funds which completely absorbed the available engineers of the Survey staffs and per-

mitted the employment of many hundreds of unemployed technical men in undertaking or advancing important projects, such as topographic mapping, the suppression of mine fires, the plugging of abandoned oil wells on the public domain, and a survey of some of the more important mineral resources of the Eastern and Southern States. The Survey is thus enabled to continue to apply its specialized technical services in valuable ways during the emergency. Its activities for the time being are somewhat out of normal balance, the greatest present loss, which it is hoped is temporary, being in facilities and funds for publication. A summary of the activities of the year follows.

The appropriations made directly for the work of the Geological Survey for the fiscal year 1934 included 11 items, amounting to \$1,992,500. Principally because of economy measures by the administration, which restricted the use of these funds, the balances of these appropriations unexpended as of June 30, 1934, totaled \$346,287.23, of which \$248,000 was continued available for expenditure during the fiscal year 1935. In addition, \$9,345.80 was allotted from appropriations for the Interior Department for miscellaneous supplies.

A detailed financial statement is given at the end of the report.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—The geologic field work done during the year included a continuation of surveys of phosphate and oil shale in Wyoming, oil in California, coal in New Mexico, and metal-mining districts in Colorado, Idaho, and New Mexico, also work under allotments from the Public Works Administration in 19 States east of the Rocky Mountains, on projects involving mineral-resources and land-classification surveys. The work in the metal-mining districts was aided by cooperative funds provided by the States, and continuation of the volcanologic work in Hawaii was made possible by contributions from the Hawaiian Research Association. A survey of the mineral resources of the Boulder Dam region in Nevada, Arizona, and California was made for the Bureau of Reclamation, and reservoir dam sites in several Western States were examined for the Bureau of Reclamation and the Indian Service. During the year 4,259 examinations were made by the section of chemistry and physics, including 1,109 tests or identifications of specimens for persons not officially connected with the Survey.

Explorations in Alaska.—In the field season of 1933 4 field projects in Alaska were undertaken, 2 of which were primarily topographic and 2 primarily geologic. One of the topographic projects was carried on in cooperation with the Navy Department, and one of the geologic projects in cooperation with the Alaska Railroad. The usual general survey of recent mining developments and the collection of mineral statistics were continued. Seven field projects for the season of 1934 had been started at the end of the fiscal year and will be continued throughout the open season. One of these projects is carried on in cooperation with the Alaska Railroad. In addition to these field projects, work was continued throughout the year in the preparation of base maps from the aerial photographs taken in 1926 and 1929 by the Navy Department. For part of the time this cooperative work was carried on in the Washington office, but for the greater part of the year it was done in Juneau, Alaska, with an enlarged staff.

Topographic mapping.—The area mapped topographically during the year amounted to 21,534 square miles, and the total area now mapped exclusive of Alaska is 1,394,266 square miles. Ten States, the District of Columbia, and Hawaii are completely mapped, and the percentages in the other States range from 9.4 in Florida to 88.9 in Virginia. Of the continental United States exclusive of Alaska, 46.1 percent has been mapped. Cooperative funds furnished by the States for topographic mapping during the year amounted to \$181,692.24 and came from 12 States and 1 county. Cooperative aid was also extended to the Division of Subsistence Homesteads.

At the request of the Bureau of Public Roads, through the use of transferred funds, the preparation of a transportation map of the United States was begun. The plan provides for a series of 439 rectangular sheets on a uniform scale of 1:250,000, covering the entire country but to be issued in State units. The maps will show the routes of travel and transportation by land, water, and air.

Aerial photographs were furnished by the Air Corps, United States Army, covering 7,961 square miles, and by commercial firms covering 23,522 square miles, for use in the compilation of topographic base maps, both with and without contours.

Investigation of water resources.—The work on water resources is done largely in cooperation with Federal bureaus, with State, county, municipal, and other governmental agencies, and with permittees and licensees of the Federal Power Commission. The funds made available by States and municipalities for cooperative work during the year amounted to \$467,226.35. In addition, data valued at over \$145,000 were furnished by cooperating officials. Investigations of surface water were carried on in the 48 States, the District of Columbia, and Hawaii, and 2,941 regular gaging stations were being maintained at the end of the year. In this work 41 States and Hawaii cooperated. About 65 investigations relating to ground water were in progress during the year in 28 States and Hawaii. In the hydrologic laboratory 383 samples of water-bearing material were analyzed. The work on quality of water involved the analysis of 1,226 samples from surface and underground sources. The investigations of power resources included the preparation of monthly and annual reports on the production of electricity for public use and the fuel consumed in generating it, a report on the developed water power of the United States, and a report on the capacity of water wheels in water-power plants in the United States. Investigations of problems affecting the utilization and control of the waters of streams were continued.

Classifying and leasing public land.—The classification of public and quasi-public lands with respect to mineral, water-power, and agricultural value and the technical supervision of mineral and power development on such lands were continued in 22 States and Alaska. The number of cases involving land classification acted on during the year was 10,464, and the results accomplished include the classification of 482,840 acres as coal land, 593,834 acres as noncoal land, with a net reduction of 936,433 acres in outstanding coal withdrawals. At the end of the year the total area classified as mineral in character was 37,487,759 acres in 14 States and Alaska, and the outstanding mineral withdrawals amounted to 49,985,402 acres in 14 States. Definitions of "known geologic structure" covered 15,395 acres in 3 States, and at the end of the year the areas so defined amounted to 960,346 acres in 7 States. Investigations to obtain basic information as to the water-power resources of public lands covered about 1,400 linear miles of streams in 11 States and included studies of foundation material and conditions at 6 dam sites in 3 States. There was a net increase of 117,561 acres in the existing power reserves, making a total of 6,800,371 acres in 22 States. The areas designated as subject to the stock-raising homestead act had a net reduction to 119,339,332 acres in 20 States, and the area designated as subject

to the enlarged-homestead act had a net reduction to 294,413,685 acres in 14 States. There was a net increase in public water reserves, to 494,728 acres in 13 States. Federal properties subject to the mineral-leasing laws under supervision at the end of the year numbered 7,122 in 19 States and Alaska and involved a total of 9,541,487 acres. Leases, licenses, and prospecting permits were issued for 1,247 properties and terminated for 368 properties. The mineral production from lands under leases, licenses, and permits amounted to 25,055,175 barrels of petroleum, 57,866,857 cubic feet of natural gas, 87,728,595 gallons of gas gasoline, 2,688,687 tons of coal, 289,837 tons of potassium, 45,830 tons of sodium, and 43,067 tons of phosphate. The revenue accrued from these operations in the form of royalty, rent, or bonus amounted to \$3,991,571. Technical supervision of mineral development on Indian lands and of operations for the production of oil and gas in naval petroleum reserves was continued. The work undertaken with funds allotted by the Public Works Administration covered 49 projects in nearly all the public-land States. The allotments for these projects amounted to \$889,964. Most of the projects were planned for continuance during a period of 18 months and were not completed at the end of the year.

Publications.—The publications of the year consisted of 47 books and pamphlets in the regular series, covering 6,602 pages, 91 new or revised maps, and 157 reprinted maps. In addition to these publications, 46 brief papers in mimeographed form were issued as memoranda for the press. The publications distributed numbered 774,927, of which 1,358 folios and 457,965 maps were sold for \$36,723.30.

GEOLOGIC BRANCH

SUMMARY

At the beginning of the fiscal year the geologic branch faced a reduction of 37½ percent from the inadequate funds available for the preceding year. Field work was still further curtailed, though four small parties already in the field, surveying phosphate and oil shale lands in Wyoming, oil in the San Pedro Hills of California, and coal in northwestern New Mexico, were continued in field service for varying brief periods. With the aid of cooperative funds contributed by the States, work was also continued in the metal-mining districts of Colorado, Idaho, and New Mexico.

Geologists unable to undertake field investigations devoted their energies largely to completion of reports on field surveys of previous years. Office work was reduced, however, by the extended administrative furloughs that were necessary for members of the branch's professional staff. Volcanologic work in Hawaii could not have been continued without the help of the local voluntary Hawaiian Research Association, which contributed a large proportion of the salaries of the three employees and the expenses of the observatory on Kilauea.

Early in January 1934 the Public Works Administration allocated \$276,000 for mineral-resource and land-classification surveys by the geologic branch in 19 States east of the Rocky Mountains, from New York and North Dakota on the north to Florida and Texas on the south. Work was begun on these projects almost immediately in the South and extended northward as climatic conditions per-

mitted. It will be continued on most of the projects through a considerable part of the next fiscal year. The progress of the work on each of them is summarized under the heading "Work of the year, by States." While giving employment to more than 150 unemployed geologists, engineers, technical assistants, and laborers, these projects have necessarily been under the direct supervision of trained members of the branch's regular staff.

Members of the geologic branch were also detailed to conduct a survey of the mineral resources of the Boulder Dam region in Nevada, Arizona, and California for the Bureau of Reclamation, and to assist in Public Works projects under the conservation branch in Oklahoma and under the water-resources branch in Georgia, New Jersey, Colorado, Utah, and Arizona. Geologists have also been assigned to the examination of reservoir dam sites for the Indian Service and the Bureau of Reclamation in several Western States.

WORK OF THE YEAR, BY STATES

Alabama.—Reports on the brown iron ores of the Russellville district and the iron ore of the Red Mountain formation, in northeastern Alabama, cooperative projects with the Geological Survey of Alabama, are in preparation. Projects in the State financed by the Public Works Administration were begun by parties supervised by members of the Geological Survey, with 26 temporary employees. Mapping of the Woodstock brown iron ore area was done under project 157. Project 161 provided for investigations in the Russellville district to determine the reserves of brown iron ore; a study of gold and tin resources, comprising a reconnaissance through the mineralized areas in northern Alabama, with mapping of the Hog Mountain and other gold-mining districts, and an examination of tin prospects resulting in a brief paper on "Tin deposits of Alabama"; explorations for bleaching and other high-grade clays; and a survey of bauxite deposits.

Arizona.—Reports are in preparation on the geology and ore deposits of the Ajo copper district, the geology of the Tucson quadrangle, and manganese deposits near Artillery Peak. The Boulder Dam investigation is noted under California.

Arkansas.—Under Public Works project 163, field studies were made of coal and gas resources of the Arkansas Valley in Sebastian County and adjacent areas in Crawford, Franklin, and Scott Counties; detailed topographic and geologic mapping of the southern Arkansas quicksilver district and investigations of supposed cinnabar occurrences outside the main district were carried on; and a preliminary reconnaissance to determine areas for prospecting for bauxite was conducted in Pulaski, Saline, and Hot Springs Counties. These surveys, which gave employment to 16 temporary assistants, were all still in progress at the end of the year. A paper on enargite and wulfenite in ore deposits of northern Arkansas was transmitted for outside publication, and a paper on the origin of lead and zinc deposits of northern Arkansas was prepared for presentation before the Geological Society of Washington. Other projects and reports are noted under Oklahoma.

California.—Work was continued on the general report on the Kettleman Hills oil and gas field, on a paper on faulted folds and the formation of arcs of the North Dome of this field, and on core and outcrop samples from the region, and an advance edition of a geologic and structure map of the area was issued.

Field work in connection with the study of source rocks of oil was continued in the vicinity of Los Angeles and other areas, and, aided by a grant from the Geological Society of America, samples were collected from many localities in the State in connection with the study of the calcium carbonate content of fine-grained clastic sediments. A paper on the source beds for petroleum in the Mesozoic rocks on the west side of the Sacramento Valley was completed for publication in the Bulletin of the American Association of Petroleum Geologists, and work was continued on a report on salinity compared with temperature as a factor affecting the calcium carbonate content of sediments. Field work in the San Pedro Hills was completed, and office work was begun on the compilation of data for a report on the geology and mineral resources of the area. Studies of the lithium pegmatites of San Diego County were resumed. A survey of the Nevada City mining district was begun with aid from the Geological Society of America. Continued field and office work was done in connection with the preparation of reports on the San Andreas Rift and Cajon Pass and the southern portion of the Death Valley region, and progress was made on reports on the geomorphology of the upper San Joaquin Basin, on the Monterey siliceous rocks, on the Grass Valley mining district, and on chromite deposits in northern California.

By the aid of a transfer of \$10,000 from a fund of \$25,000 allotted by the Public Works Administration to the Bureau of Reclamation for a resource and industrial survey of the Boulder Dam region, 6 geologists of the Geological Survey devoted from 6 weeks to 4 months each to the field study of the mineral resources that lie in Arizona, California, Nevada, and Utah within 200 miles of the Boulder Dam. A reconnaissance survey was made of the principal ferrous and nonferrous metal deposits and most of the nonmetallic mineral deposits of the area, and a somewhat more detailed study was made of the magnesite resources of the Muddy Mountains, Nevada. A preliminary report on this survey is about ready for transmission, and the final report will be completed soon. Drafting work toward the completion of the geologic map of California was carried on under Public Works project 153, and a new building for the volcanologic station at Mineral was completed under project 151.

Colorado.—Investigations of the mining regions of the State have been carried on for several years in cooperation with the Geological Survey Board of Colorado and the Colorado Metal Mining Fund. Field work was continued in the Ouray, Red Mountain, and Sneffels districts of the San Juan region and in the Nederland tungsten district of Boulder County and other parts of the Front Range and was completed in the Jamestown district, Boulder County, and in the Snowmass district, Pitkin County. The smaller mining districts of Chalk Creek, Granite, Frisco, and Tenmile were examined, and stratigraphic studies of several sections were made. A press memorandum on the Red Arrow gold discovery, in the La Plata Mountains of Montezuma County, was issued; the report on Paleozoic stratigraphy was nearly completed; some progress was made on a general report on the geology and ore deposits of the State and on a report on the Cripple Creek district. Two papers resulting from these investigations were published by the Colorado Scientific Society—"Vein system of Arrastre Basin and regional geologic structure of the Silverton and Telluride quadrangles" and "A recent rock slide near Durango, in La Plata County"—and several other papers were submitted for publication through unofficial mediums.

At the request of the Public Works Administration, examinations were made in the Cripple Creek district with special reference to a proposed deep drainage tunnel and at the town of Englewood with reference to the adequacy of the artesian water supply. An examination of the Douglas Creek diversion tunnel was made for the State engineers.

Florida.—Areas of reserved public lands in Marion and Polk Counties are being prospected for phosphates under Public Works project 164, by a party in which 10 temporary assistants are employed. Reports were in progress on the Tampa limestone, on Choctawhatchee gastropods from the Allaqua Creek Valley, and on Pelecypoda of the Alum Bluff formation. Reports on a new species of *Pecten* from the Oligocene near Duncan Church, Washington County, and on the pelecypod genus *Vulsella* in the Ocala limestone of Florida and its bearing on correlation were submitted for publication in a scientific journal.

Georgia.—Work on the gold and associated economic minerals of Georgia, by parties working under Public Works projects 158 and 165, consisted of detailed mapping in the Dahlonega district of Lumpkin County, examination of mines of McDuffie County, a reconnaissance of all the active gold properties and most of the old mines of the State in the gold belt, and a reconnaissance of kyanite and vermiculite in northern Georgia. Field reports and maps have been prepared.

Idaho.—Cooperation with the Idaho Bureau of Mines was continued in the mining districts of the Boise Basin, Thunder Mountain, Yellow Pine, and the western part of the Nez Perce National Forest. Work was continued in the office on the compilation of data for a report on the geology and ore deposits of the Bay-horse region, Custer County; a general report on southeastern Idaho; and a report on the Idaho mining districts (a revision of the Idaho portion of Bulletin 507). Reports by geologists of this Survey on the Dome mining district, Butte County, and on gold-bearing gravel of the Nez Perce National Forest were published as Pamphlets 39 and 40, respectively, of the Idaho Bureau of Mines. Preparation of a report on the geology and mineral resources of the Paradise Valley and Ammon quadrangles was continued.

Papers on recent block faulting in Idaho, on contact phenomena associated with the Cassia batholith, on the composition of a part of the Idaho batholith, Boise County, on silver mineralization in the Banner district, Boise County, and on the correlation and interpretation of Paleozoic stratigraphy in south-central Idaho and an abstract of a paper on stratigraphic correlation by heavy minerals in Paleozoic beds in Idaho were transmitted for outside publication.

Illinois.—Work on the Pottsville flora of the Eastern Interior Basin was continued in cooperation with the Illinois Geological Survey. Under Public Works project 166 an investigation of the fluorspar reserves in southern Illinois was begun by a party of four temporary assistants under the supervision of a geologist of the United States Geological Survey.

Indiana.—Office work was continued on a report on new crinoid genera from the Mississippian, Devonian, and Silurian.

Iowa.—Work was continued on a paper on the typical Kinderhook fauna.

Kansas.—Under Public Works project 167 a survey of the coal resources of Cherokee, Osage, Labette, and Crawford Counties was begun by a party which included three temporary junior geologists, and geologic mapping and examination of mines were carried on in southeastern Kansas as part of a study of lead and zinc in the tri-State district (Oklahoma, Kansas, and Missouri).

Kentucky.—Public Works project 168 provided for detailed mapping of the coal field in Pike County, in which 8 temporary junior geologists were employed, and for a survey of the deposits of bleaching and other high-grade clays of western Kentucky by a temporary junior geologist, with 2 rodmen, under supervision of Survey geologists. Work is still in progress.

Maryland.—A study of the sand and gravel resources of the area tributary to Washington and Baltimore is being made under Public Works project 169 by a geologist with one assistant and has covered areas in Prince Georges and Montgomery Counties.

Massachusetts.—Work on the geology of the Taconic quadrangle was continued.

Michigan.—See Minnesota.

Minnesota.—A report on the pre-Cambrian rocks of the Lake Superior iron-ore region is in process of publication by the Survey as Professional Paper 184.

Mississippi.—Public Works project 171 provided for an investigation of the bleaching and other high-grade clays of Mississippi, and reconnaissance examinations in several countries of south and central Mississippi, with detailed examination of some more promising deposits in Smith County, were made by 2 geologists and 3 assistants. A brief examination of bauxite in the vicinity of Ripley, Pontotoc, New Albany, and Oxford was made. A paper on the volcanic and structural history of the Jackson anticline is in preparation.

Missouri.—In connection with investigations under Public Works project 172 for a study of the tri-State lead and zinc area, stratigraphic studies, mapping of underground structure, and examination of the principal mines were made by a party of three temporary employees working under the supervision of a Survey geologist, in the Joplin, Waco, Jet, and Carthage districts, Jasper County, and the Diamond district, Newton County. This project also provided for investigation of the manganese deposits of southeastern Missouri, the field work for which was completed.

Some progress was made on reports in preparation on the Pleistocene diversion of the Mississippi River across Crowleys Ridge, in southeastern Missouri, on the Warsaw fauna of the Boone limestone from the Joplin district, and on the fauna of the Louisiana limestone of northeastern Missouri.

Montana.—Reports on the lignite field of McCone County and on the Mizpah coal field of Custer County were completed for Survey publication, and reports on the geomorphology and glacial geology of western Montana, fossil plants from the Fort Union and associated formations, the geology and mineral resources of parts of Liberty Hill and Chouteau Counties, the Pioneer gold district, and the phosphate near Maxville, Philipsburg, and Avon, Granite County, were in preparation. A report on the geology and ore occurrences in the Flathead mine and vicinity, Flathead County, was transmitted to the Montana Bureau of Mines for publication. Mapping of the geology and ore deposits of the Libby quadrangle was continued. A report on gold quartz veins south of Libby was issued as Circular 7.

Nevada.—Reports are in progress on the Tonopah, Tuscarora, Gold Range, Searchlight, and Delamar mining districts. A report on the Contact district was completed and transmitted for publication, and a number of papers prepared as byproducts of the official reports were submitted to scientific and technical journals.

New Mexico.—Field studies on the east side of the San Juan Basin, in Rio Arriba County, were continued with special reference to the coal and oil possibilities of the region. The report on the La Ventana-Chacra Mesa coal field, lying partly in McKinley, Sandoval, and San Juan Counties, was completed for publication as part 3 of the bulletin on the geology and fuel resources of the southern part of the San Juan Basin, and work was continued toward the preparation of a detailed report on the Mount Taylor coal field. Studies have been carried on in cooperation with the New Mexico Bureau of Mines and Mineral Resources in the Central mining district and the Virginia mining district of the Lordsburg area, and a report on the Bayard area of the Central mining district was completed. A report on the geology and ore deposits of the Magdalena district is in preparation. Economic and petrographic studies of cores from Government potash tests were made.

New York.—A survey of the gas resources of south-central New York under Public Works project 173 was in progress in Allegany, Cattaraugus, Chemung, and Steuben Counties, by 2 geologists, with 7 temporary assistants.

North Carolina.—The gold-bearing regions of North Carolina, including the principal gold-placer areas, were examined by several parties directed by Survey geologists under an allotment from the Public Works Administration (projects 158 and 174). One party consisting of a temporary geologist with assistance of a rodman completed geologic mapping and examination of mines and mining localities in the slate belt extending from Anson County to Davidson County; and another party made a reconnaissance of the gold-bearing regions of the western part of the State, with detailed studies of the mines and prospects in Gaston and Mecklenburg Counties. Reports on these investigations were well advanced.

North Dakota.—The Public Works Administration under project 159 provided for an investigation of the coal resources of the Minot district, and work was begun in May and continued to the end of the fiscal year by a Survey geologist and two temporary assistants. Mapping of the Minot and Sawyer quadrangles and the northern part of the Benedict quadrangle was accomplished.

Oklahoma.—A study of the lead and zinc of the tri-State district (Oklahoma, Missouri, and Kansas) was financed by the Public Works Administration, the work in Oklahoma being a part of project 175. Before detailed work was begun a preliminary reconnaissance of the district was made by two Survey geologists. For several months a Survey geologist with four field assistants has been engaged upon a study of the structural features of certain typical mines of the region, including those near Picher, with a general stratigraphic examination of the area. Project 175 also provided for a study of the coal and gas in the Henrietta-Eufaula-Stone Bluff area of eastern Oklahoma. A party under the direction of 2 Survey geologists employing 2 junior geologists and 3 field assistants mapped an area in northern Pittsburg, western Haskell, and western Latimer Counties.

Office work on reports on the following subjects was continued: The Howe-Wilburton coal district of southeastern Oklahoma, the Pennsylvanian flora of the coal fields of eastern Oklahoma, the Moorefield fauna, the fauna of the Sycamore limestone, and the Radiolaria from Arkansas novaculite and from the Bigfork chert of Oklahoma and Arkansas; and the report on the geology and coal resources of the McAlester district, Pittsburg, Atoka, and Latimer Counties, was completed for official publication. Papers on the correlation of the Pennsylvanian strata in the Arkansas and Oklahoma coal fields, the Carboniferous rocks of the Ouachita Mountains, the relation of the Ouachita belt of Paleozoic rocks to the oil and gas fields of the Midcontinent region, and the age of the Jackfork and Stanley formations of the Ouachita geosyncline as indicated by plants were submitted for publication by the American Association of Petroleum Geologists.

Oregon.—Reports on the geology and mineral resources of the Baker quadrangle and on nonmetallic mineral resources of eastern Oregon have been submitted for publication. Circular 8, on the beach placers of the Oregon coast; Bulletin 846-A, on some mining districts of eastern Oregon; and Bulletin 846-B, on the geology and ore deposits of the Takilma-Waldo district, including the Blue Creek district, were issued.

Pennsylvania.—The report on the geology and mineral resources of the Butler and Zelienople quadrangles was completed, and work was continued on reports on the geology and mineral resources of the Reading, Boyertown, Hanover, York, Honeybrook, and Phoenixville quadrangles and on the lower Kittanning coal bed of western Pennsylvania.

South Carolina.—The report on the geology of the Coastal Plain of South Carolina was completed. Under Public Works projects 158 and 176, a reconnaissance of the gold belt of the State was made, and later a survey of the gold-

bearing rocks and associated economic minerals was carried on in York and Cherokee Counties by a temporary junior geologist and one assistant under the supervision of a geologist of the Survey.

Tennessee.—Under Public Works project 177, 2 geologists of the Survey with a temporary junior geologist and 5 field assistants made a reconnaissance of the zinc areas of eastern and northern Tennessee and did areal mapping in the Mascot-Jefferson City and White Pine districts, studied the Felknor and Grasselli zinc mines, made examinations in the Powell-Clinch River belt and the Sweetwater barite district, and visited the Coker Creek gold district.

In connection with a study of the high-grade clays of the State of possible economic importance, also provided for under project 177, examinations were made of the bleaching and ball clay deposits in Carroll, Hardeman, Henry, and Madison Counties, in western Tennessee, and of the fire clays in the eastern part of the State, particularly in Cumberland County.

Texas.—Public Works project 178 included allotments for a study of the Terlingua and Shafter mining districts, the bleaching clays of the San Antonio area, the brown iron ores of northeastern Texas, and the oil, gas, and coal resources of part of north-central Texas. The examinations in the Terlingua quicksilver district, Brewster County, and the Shafter silver district, Presidio County, have given employment to three additional men. A progress report on the Terlingua district was issued by the Texas Bureau of Economic Geology. A party composed of 2 geologists, 4 assistants, and 5 laborers is engaged in a survey of the brown iron ore area, which includes detailed studies in Cass, Marion, and Morris Counties and a reconnaissance of small deposits in Gregg, Harrison, Rusk, and Upshur Counties. The study of the clays of the San Antonio area, made by a Survey geologist with three assistants, included prospecting for fuller's earth and ceramic clays in Bexar and Medina Counties and examination of clay localities in Atascosa and Wilson Counties. Geologic mapping has been carried on in Young, Stephens, Coleman, and Brown Counties in connection with the study of the oil, gas, and coal resources of parts of north-central Texas and gave employment to seven temporary assistants.

The compilation of the cooperative State geologic map and the revision of the cooperative monograph of fossils from the Navarro formation of Texas progressed. Further field and office studies of Permian rocks in the Diablo Plateau region were made. Studies of core material from Government potash tests in Texas were completed.

Utah.—The report on the geology of the Monument Valley-Navajo Mountain region, San Juan County, was completed and transmitted for publication as a bulletin of the Survey. Manuscripts of reports on a geologic and geographic reconnaissance of southeastern Utah, on the geology and mineral resources of the Randolph quadrangle, and on the Book Cliffs coal field southeast of Sunnyside were nearing completion, and progress was made on the reports describing the geology of the Green River Desert and the eastern flank of the San Rafael Swell and on the stratigraphy and structure of the region between the Green and Colorado Rivers, Grand and San Juan Counties. A report on the geology and ore deposits of the Cottonwood-American Fork mining region has been revised by the authors.

Vermont.—Field and office work in continuation of a study of the geology of northwestern Vermont was carried on, and a paper on the Ordovician-Silurian relations in Vermont was in course of preparation.

Virginia.—A study of the zinc deposits of an area in the vicinity of Wytheville, in Wythe and Smyth Counties, which is an extension of the zinc-lead region under examination in eastern Tennessee, was conducted by a geologist with one assistant and was financed by Public Works project 158.

The titanium deposits of Nelson and Amherst Counties were investigated in connection with a report on the titanium minerals of Virginia in preparation. Lands in an area proposed as an addition to the Monongahela National Forest were examined by a Survey geologist, and a report submitted to the Forest Service.

West Virginia.—Study of the manganese ores of eastern West Virginia under Public Works project 179 was made by a Survey geologist and one assistant. The examinations extended over portions of Morgan, Berkeley, Mineral, Hampshire, Grant, Hardy, Pendleton, Pocahontas, Greenbrier, Monroe, Mercer, and Jefferson Counties. A report was made to the Forest Service in connection with the proposed addition to the Monongahela National Forest.

Wisconsin.—See Minnesota.

Wyoming.—Field study of the oil-shale deposits of the Fossil and Washakie Basins of southwestern Wyoming was continued, and office work on reports on the Tertiary rocks and the oil shale of the Green River Basin were in progress. Field mapping was also continued in a portion of the Afton quadrangle in connection with the detailed study of the geology and mineral resources of this area, and an examination was made of the Washakie dam site, on the Wind River, for the Office of Indian Affairs.

WORK IN CHEMISTRY AND PHYSICS

The work in chemistry and physics includes the chemical analysis of rocks, ores, and minerals collected by geologists, tests necessary to identify specimens received by the Survey, the development of new tests and methods of analysis required by the expanding use of natural resources and the rarer elements, descriptive mineralogy, including studies of the physical properties of rocks and minerals, and geophysical investigations covering such subjects as deep earth temperatures, the formation of sedimentary deposits, radioactivity, and geologic time.

Among the materials analyzed in the laboratory during the year were a rubidium-bearing biotite from South Dakota, a radioactive microlite from Colorado (the age of which can be computed from the analysis), magnesite from California, hydromagnesite from Nevada, native lead and bismuth from Alaska, over 30 igneous rocks, a great many clays, ores, phosphates, and several new minerals.

During the year 4,259 examinations were made by the section of chemistry and physics. In addition to 1,109 specimens tested or identified for persons not officially connected with the Survey, 951 chemical analyses were made for geologists or in aid of geologic projects, 778 analyses were made in connection with methods of analysis and with geochemical studies relating to the formation of ores and minerals and their alteration under natural conditions, and 1,421 identifications of minerals in potash cores, well cuttings, and similar samples were made by petrographic methods or other tests.

ALASKAN BRANCH

The Geological Survey work in Alaska is concerned primarily with the investigation of the mineral resources of the Territory and comprises field examination of the various factors that pertain to the character, distribution, and development of these resources and laboratory and office studies by which these field observations are analyzed and coordinated and the results made available to the public through reports, maps, and other media. In addition to the funds regularly appropriated by Congress for this work, Public Works Administration funds were granted to supplement those for a general project (Federal project 162) and to enable the Geological Survey to carry on certain special work (Federal project 69). Cooperation was also continued with the Alaska Railroad, and some work was done in cooperation with the Navy Department. Insufficient funds necessitated disbanding early in July 1933 the personnel that for several years had been attached to local Alaska field offices to maintain technical supervision over the oil and coal prospecting permits and leases granted by the Government. For the rest of the year this supervision was carried on by the personnel engaged in similar work in the States proper.

Manuscripts and publications.—During the year 16 reports and 2 maps have been published, and 3 maps were issued in preliminary photolithographic editions. In addition, 12 manuscript reports (including maps) and 1 separate manuscript map have been completed by their authors and are in various stages of critical review, proof, or preparation for publication. At the end of the year 6 manuscript reports and 4 manuscript maps were partly completed.

Work of the year.—In addition to the routine duties of handling all matters relating to the Geological Survey's part in the development of Alaskan mineral resources, 7 principal projects, 4 of which involved new field work, were carried on during the season of 1933. The field projects included 2 that were primarily geologic and 2 that were primarily topographic. The geologic projects were a reconnaissance of the principal mining camps in the Ruby-Kuskokwim region of central Alaska and reconnaissance investigations of the potential lode resources of the Willow Creek-Kashwitna district of the Cook Inlet-Susitna region—an area contiguous to the Alaska Railroad in central southern Alaska—in which the Geological Survey cooperated with the Alaska Railroad. The 2 topographic projects were the continuation of surveys in southeastern Alaska to extend the mapping northward from the Wrangell district to include areas adjacent to Sumner Strait, and a detailed survey of part of the chain of the Aleutian Islands in cooperation with an expedition sent by the Navy Department for special examinations. The 3 projects not directly involving new field work were the annual canvass for the collection of statistics regarding mineral output, as a basis for the Geological Survey's annual report on the progress of the mineral industry; the continuation of the compilation of a drainage map of southeastern Alaska from aerial photographs taken some years before by the Navy Department at the request of the Geological Survey; and the preparation of a comprehensive report

on a large area in the central part of the Copper River region, so as to coordinate and make current the various observations and investigations that had been in progress in this area for more than 30 years. Although listed above as one of the nonfield projects, it should be noted that the work of compilation from aerial photographs was carried on for more than 8 months in Juneau, Alaska, with a drafting force that had been assembled mainly in that locality. Toward the later part of the field season of the chief Alaskan geologist was temporarily relieved of his Survey duties, and for nearly 5 months he served as representative for Alaska of the Federal Emergency Administration of Public Works, spending all of that time in the Territory.

Owing to the allotment of funds from the Public Works Administration it was possible to expand somewhat the Alaska program of the Geological Survey in the winter of 1933-34 and to send out the parties for the season of 1934 more adequately manned. As a result 9 principal projects, 7 of which involved new field work, were started during that period, though all of them will extend over into the next fiscal year. Of these field projects, 5 were primarily concerned with geologic investigations and 2 with topographic mapping. The projects involving new geologic field work were located in the area adjacent to Ketchikan in southeastern Alaska; part of the Alaska Range, including the headwater region of the Copper River Valley and parts of the Tanana Valley; the Kaiyuh Mountains, which lie south and east of the Yukon River in the region west of Ruby and southeast of Kaltag; the northern and eastern part of Kodiak Island, in southwestern Alaska; and the coal fields adjacent to Eska, in the Matanuska district of the Cook Inlet-Susitna region. The Eska work was financed by and carried on at the request of the Alaska Railroad and mainly in its interest. The topographic projects include the mapping of an extensive tract of Admiralty Island and adjacent parts of the Juneau district, in southeastern Alaska, and mapping of parts of the Alaska Range at the head of the Copper River, especially in the vicinity of Mentasta Pass and Suslota Lake. The two projects not directly involving new field work were the continuation of the compilation of drainage maps of southeastern Alaska from the airplane photographs taken by the Navy Department and the annual canvass of mineral production.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 46.1 percent mapped, the year's increment amounting to 0.5 percent. The area covered by topographic base maps without contours and prepared from aerial photographs after field examinations continued large. The resurveys in large part covered areas previously surveyed on a smaller scale.

New topographic surveys of the United States, July 1, 1923, to June 30, 1934, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (engraved publication unless otherwise stated) for publication on scale of 1 to—					Total area mapped in fiscal year (square miles)			Percent- age of total area mapped to June 30, 1934	Spirit levels (miles)	Transit traverse (miles)	Triangulation stations occupied
		12,000 or larger	24,000	31,680	48,000	62,500	125,000	Revi- sion	Resur- vey				
Alabama.....	20.....					310		238	72	41.5	295	253	
Arizona.....	25, 50.....		1 52		36	1,069		245	408	52.4	1,224		82
Arkansas.....	10, 20, 50.....					749		452	454	43.4	335	468	
California.....	2, 4, 5, 25, 50, 100.....	2 3	298	141		401	1,666	306	1,747	83.8	815		60
Colorado.....	20, 50, 100.....			5	2 103	261			266	54.5	430	354	10
Connecticut.....										100.0	27		
Delaware.....	10.....					54		54		100.0	48		
District of Columbia.....										100.0			
Florida.....	10, 20.....					785			785	9.4	625	593	
Georgia.....	5, 20.....	2 49				248		242	15	42.1	301	242	
Illinois.....	10, 25, 50, 100.....		2 65			20	200	65	220	39.2	479		39
Indiana.....	5, 10, 20.....					1,351		212	1,095	66.5	19		
Iowa.....	20.....					17			17	10.1	208	75	
Kansas.....	10.....			191		96			287	23.5	185	130	
Kentucky.....	20.....					296			296	78.4	263	236	4
Louisiana.....	5, 20.....		2 2190			508			1,397	66.3	154	274	
Maine.....	20.....					211			211	23.4	475	127	
Maryland.....	20.....					184		184		63.5	61		
Massachusetts.....	10.....			224				224		100.0	243	267	
Michigan.....	5.....			2 291				5		100.0	1,039		
Minnesota.....	20.....					57			57	24.3	50	168	
Mississippi.....	30.....					256			256	9.7	119	262	
Missouri.....	5, 10, 20.....		82	364		2,186		650	1,982	15.0	177	154	
Montana.....	25, 100.....					56	20		76	48,775	1,220	1,222	
Nebraska.....	10.....					235			235	29.6	230	297	14
Nevada.....	50, 100.....					22	362		384	35.3	450		
New Hampshire.....										48.5			31
New Jersey.....	5, 10.....	2 4 5		5				10		100.0	96	109	
New Mexico.....	20, 50.....			16		1,016		272	760	100.0	661		58
New York.....	20.....					221		221	43	100.0		116	

¹ Lithographic publication. Final publication 1:62,500.

² Lithographic publication only.

³ Mapped on scale of 1:4,800.

⁴ Mapped on scale of 1:9,600.

⁵ Includes 1,301 square miles of culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.

⁶ Includes 286 square miles of culture, drainage, and woodland prepared from aerial photographs, after field examination. Contours not added.

	1, 2, 5, 10, 50.	(²)	295	259	554	20	19,040	36.3	547	164	37
North Carolina.....	5	1 20	59	20	59	59	13,168	18.6	73	119	---
North Dakota.....	5	1 86	59	554	554	554	41,940	100.0	107	203	---
Ohio.....	5, 10, 20.	1 86	216	403	147	472	36,932	38.2	228	560	---
Oklahoma.....	50, 100.	---	637	---	125	532	38,760	85.9	419	---	---
Oregon.....	20.	---	---	---	---	---	1,248	100.0	49	---	---
Pennsylvania.....	10, 20.	---	---	---	---	---	14,373	47.0	---	---	---
Rhode Island.....	20.	---	836	---	---	---	19,355	24.9	139	252	---
South Carolina.....	20.	---	112	---	---	---	23,633	56.2	284	42	98
South Dakota.....	1, 5, 10, 50.	(¹) 1 6	68	---	179	6	89,331	33.6	514	558	7
Tennessee.....	20, 50.	---	930	---	92	---	19,981	23.5	427	---	35
Texas.....	5, 20, 100.	1 59	---	100	---	---	8,246	86.2	199	---	---
Utah.....	20.	1 106	107	---	839	---	37,897	88.9	657	247	194
Vermont.....	10, 20, 50.	---	569	---	---	---	37,601	54.4	15	21	---
Virginia.....	25, 50, 100.	1 2	204	182	---	---	24,170	100.0	2	13	---
West Virginia.....	20.	1 2	82	---	2	---	19,237	34.3	---	---	---
Wisconsin.....	5, 50, 100.	10 2	18	215	20	215	31,823	32.5	86	---	---
Wyoming.....	---	---	---	---	---	---	---	---	---	---	---
Total continental United States (exclusive of Alaska).	---	27	708	3,148	7,453	13,494	1,394,266	46.1	14,376	7,526	669
Hawaii.....	---	---	---	---	---	---	6,435	100.0	238	---	82
Puerto Rico.....	---	---	---	---	---	---	---	---	---	---	---

¹ Lithographic publication only.² Mapped on scale of 1:9,600.³ 138 acres mapped on scale of 1:1,200.⁴ 6 acres mapped on scale of 1:4,800.⁵ Mapped on scale of 1:2,400.⁶ Mapped on scale of 1:4,800.

FIELD SURVEYS

Through the use of regularly appropriated funds and of funds made available by the Federal Emergency Administration of Public Works and by the Tennessee Valley Authority topographic mapping was undertaken in most of the States. Public Works projects and Tennessee Valley projects are indicated below by the initials "P.W." and "T.V.A." Cooperation with States was continued on a smaller scale than in recent years, and some projects begun under cooperative or Federal allotments were completed by Public Works funds.

Alabama.—The survey of the Blocton 15' quadrangle (P.W.) was completed, and that of the Palos, Basham, and Mount Hope 15' quadrangles (P.W.) was begun.

Arizona.—The survey of the Quartzsite No. 3 quadrangle was completed for the Office of Indian Affairs. The survey of the Castle Dome Peak No. 2 15' quadrangle (P.W.) and an extension of the Petrified Forest National Monument (P.W.) was completed, and that of the Castle Dome Peak No. 3, Payson No. 1, Payson No. 2, Payson No. 3 15' quadrangles (P.W.) and Grand Canyon National Monument (P.W.) was begun.

Arkansas.—For the Forest Service the survey of the Mount Judea 15' quadrangle was completed, and that of the Swain 15' quadrangle was begun. For the Forest Service the survey of the Ozone 15' quadrangle (P.W.) was completed. The survey of the Magazine Mountain No. 3 15' quadrangle (P.W.) was completed, and that of the Watalula 15' quadrangle (P.W.) and the Alexander No. 1 7½' quadrangle (P.W.) as a part of the Alexander 15' quadrangle (P.W.) was begun.

California.—In cooperation with the State engineer of California the survey of the Eureka and Lakeport 15' quadrangles, the Halls Flat, Yreka, and Bogus 30' quadrangles, and the Cucamonga No. 1 7½' quadrangle was completed, and that of the Sebastopol 15' quadrangle was begun. In cooperation with the county surveyor of Los Angeles County the survey of the Glendora, La Verne, Sunland, Mount Lowe, Azusa, La Crescenta, Sierra Madre, Little Tujunga, Camp Baldy, and Evey Canyon 6' quadrangles was completed, and that of the Mount Wilson, Chileno Canyon, Camp Rincon, Acton, and Camp Bonita 6' quadrangles was begun. The survey of the Parkfield No. 1 and Dudley No. 2 7½' quadrangles (P.W.) was completed, and that of the Paynes Creek and Burney 30' quadrangles (P.W.) and the Yosemite Valley National Park (P.W.) was begun.

Colorado.—At the request of the Forest Service the survey of the Mount Powell No. 2 15' quadrangle was completed and the survey of the Mount Powell No. 1 15' quadrangle (P.W.) was completed. The survey of the Como No. 2 15' quadrangle (P.W.) was continued, and that of the Cherry Creek area (P.W.), Black Canyon National Monument (P.W.), and Colorado National Monument (P.W.) was begun.

Delaware.—The survey of the Deepwater Point 15' quadrangle (P.W.) was completed.

Florida.—The survey of the Boggy and West Juniper Creek 15' quadrangles (P.W.) was completed, and that of the Oscar, De Funiak Springs, and Mary Esther 15' quadrangles (P.W.) was begun.

Georgia.—The survey of the Chickamauga-Chattanooga National Military Park (P.W.) was completed, and that of the Bullochville and Thomaston 15' quadrangles (P.W.) was begun.

Idaho.—The Bureau of Mines and Geology of Idaho cooperating, the survey of Grimes Pass and vicinity was completed. The survey of the Dickey 30' quadrangle and American Falls No. 2 and American Falls No. 3 15' quadrangles (P.W.) was begun.

Illinois.—The survey of the Toledo, Hoopeston, Metamora, Petersburg, Genoa, Carthage, Dunlap, Lacon, and Mount Vernon 15' quadrangles was completed, and that of the Toluca, Camp Grove, Morrison, Oquawka, and Iuka 15' quadrangles was continued in cooperation with the Department of Registration and Education of Illinois, Geological Survey. The survey of the Sycamore 15' quadrangle (P.W.) was continued and that of the Shabbona 15' quadrangle (P.W.) was begun.

Indiana.—The survey of the Heltonville, Oolitic, and Porter 15' quadrangles (P.W.) was begun.

Kansas.—The survey of the Waldron No. 1, Waldron No. 4, Armourdale No. 2, Armourdale No. 3, Armourdale No. 4, and Olathe 1-a 7½' quadrangles (P.W.) was completed, and that of the Armourdale No. 1 7½' quadrangle (P.W.) and the western part of the Waldron 15' quadrangle (P.W.) was begun.

Kentucky.—The survey of the Sadieville 15' quadrangle (P.W.) was completed, and that of the Munfordville and Cecilia 15' quadrangles (P.W.) was begun.

Louisiana.—The Louisiana Board of State Engineers cooperating, the ground control, field examination, and preparation from aerial photographs of culture, drainage, and woodland was completed for topographic base maps without contours for the 7½' quadrangles within the Hackberry, Bayou Bois Courier, Johnsons Bayou, Grand Lake West, Lake Charles, Orange, Redfish Point, Port Arthur, Pecan Island, Grand Lake East, Sabine Pass, AAA, BBB, and CCC 15' quadrangles and begun for the 7½' quadrangles within the Mount Airy, Donaldsonville, Bonnet Carre, Spanish Fort, Crowley, and Lafayette 15' quadrangles. For the Louisiana Board of State Engineers the survey for the contours of the 7½' quadrangles within the Hackberry, Bayou Bois Courier, Johnsons Bayou, and Grand Lake West 15' quadrangles (P.W.) was completed. The survey of the Pollock and Colfax 15' quadrangles (P.W.) was completed.

Maine.—In cooperation with the Public Utilities Commission of Maine, the survey of the Rangeley 15' quadrangle was completed.

Maryland.—The survey of the Prince Frederick, Leonardtown, and Patuxent No. 2 15' quadrangles (P.W.) was begun.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, the survey of the Sagamore, Manomet, Springfield No. 1, Mitineague, and Long Meadow 7½' quadrangles was completed, and that of the Plymouth No. 2, Springfield No. 2, and Northampton No. 3 7½' quadrangles was begun.

Michigan.—In cooperation with the Department of Conservation of Michigan, Geological Survey, the ground control, field examination and preparation from aerial photographs of culture, drainage, and woodland was executed in 7½' quadrangles for topographic base maps without contours for the Mesick 15' quadrangle and the Wexford County part of the Tustin 15' quadrangle. The survey of the Sanford 15' quadrangle and the Toledo No. 1 and Maumee Bay No. 2 7½' quadrangles (P.W.) was begun. .

Minnesota.—At the request of the Forest Service the survey of the Ely 15' quadrangle was completed. The survey of the Fountain City 15' quadrangle (P.W.) was begun.

Mississippi.—The survey of the Raymond 15' quadrangle (P.W.) was completed, and that of the Edwards 15' quadrangle (P.W.) was begun.

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri the survey of the West St. Louis No. 1, West St. Louis No. 2, West

St. Louis No. 3, West St. Louis No. 4, Independence 4-c, Camp Clark, and Blue Springs 7½' quadrangles and the Red Bird, Celt, Marble Hill, Marquand, Steelville, and Sleeper 15' quadrangles was completed; that of the Upalika, Greenville, Stone Hill, Grove Spring, Big Piney, Gatewood, Berryman, Topaz, Zanoni, Manes, and Fordland 15' quadrangles and the Springfield No. 4, Sullivan No. 3, Sullivan No. 4, and Versailles No. 4 7½' quadrangles was continued; and that of the Van Buren and Fielden 15' quadrangles and the Stockton No. 3, Stockton No. 4, Kimmswick No. 1, Independence 3-a, Independence 3-c, Independence 4-b, and Independence 4-d 7½' quadrangles was begun. The survey of the Canaan 15' quadrangle (P.W.) and Harrisonville 2-b and Olathe 1-a 7½' quadrangles (P.W.) was completed, and that of the Lynn 15' quadrangle (P.W.) and the Armourdale No. 4 7½' quadrangle (P.W.) was begun.

Montana.—The survey of the Thompson 30' quadrangle (P.W.) and of the Dupuyer No. 2 15' quadrangle (P.W.) was begun.

Nebraska.—The survey of the Seward No. 1 and Seward No. 2 15' quadrangles (P.W.) was begun.

Nevada.—The survey of the Skelton 30' quadrangle and of the Gold Creek No. 4 15' quadrangle (P.W.) was begun.

New Hampshire.—The survey of the Whitefield 15' quadrangle (P.W.) was begun.

New Jersey.—The survey of the Morristown National Historical Park (P.W.) was completed, and that of the Ramapo No. 4 7½' quadrangle (P.W.) was begun.

New Mexico.—At the request of the Office of Indian Affairs the survey of the Shiprock No. 2 and Carrizo Mountains No. 1 15' quadrangles (P.W.) was completed. The survey of the Shiprock No. 1 and Shiprock No. 3 15' quadrangles (P.W.) and the Carlsbad Cavern National Park (P.W.) was completed, and that of the Carrizozo No. 4 and Arabela No. 3 15' quadrangles (P.W.) was begun. In preparation for geologic mapping the survey of the Queen No. 3 15' quadrangle was begun.

New York.—The survey of the Catskill 15' quadrangle was completed, and that of the Rhinebeck 15' quadrangle was continued in cooperation with the Department of Public Works of New York. The survey of the Binghamton 15' quadrangle (P.W.) was begun.

North Carolina.—The survey of the Guilford Courthouse National Military Park (P.W.) was completed, and that of the Corundum and Fanner 15' quadrangles (P.W.) was begun. For the Forest Service the survey of the Ranger 15' quadrangle (P.W.) was continued; that of the Table Rock No. 2, Old Fort No. 2, Montreat No. 1, and Democrat No. 4 7½' quadrangles (T.V.A.) was completed, and that of the Spruce Pine No. 1, Spruce Pine No. 2, Spruce Pine No. 3, Spruce Pine No. 4, Bakersville No. 1, Bakersville No. 2, Bakersville No. 3, Bakersville No. 4, Elk Park No. 1, Elk Park No. 2, Elk Park No. 3, and Blowing Rock No. 2 7½' quadrangles (T.V.A.) was begun.

North Dakota.—The survey of the Grand Forks No. 1 7½' quadrangle (P.W.) as a part of the Grand Forks 15' quadrangle (P.W.) was begun.

Ohio.—The survey of the Maumee Bay No. 1 7½' quadrangle (P.W.) was completed, and that of the Maumee Bay No. 2 and Toledo No. 4 7½' quadrangles (P.W.) was begun.

Oklahoma.—The survey of the Norman and Moore 15' quadrangles (P.W.) and of the Moore 7½' quadrangle (P.W.) was completed, and that of the Edmond 15' quadrangle (P.W.) and the Edmond 7½' quadrangle (P.W.) was begun.

Oregon.—For the Forest Service the survey of the McKenzie Bridge 30' quadrangle (P.W.) was begun. The survey of an extension of the Crater Lake National Park (P.W.) was continued for the National Park Service. The survey of the Disston 30' quadrangle (P.W.) was begun.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, the survey of the Smethport and Coudersport 15' quadrangles was completed, and that of the Kane and Allentown 15' quadrangles was begun. The survey of the Mifflintown 15' quadrangle (P.W.) was begun.

South Carolina.—The survey of the Hagood 15' quadrangle (P.W.) was completed, and that of the Wellford, Greenville, Killian, and Camden 15' quadrangles (P.W.) was begun.

South Dakota.—The survey of the Fort Pierre 15' quadrangle (P.W.) was begun.

Tennessee.—The survey of the Shiloh National Military Park including Cherry House (P.W.) was completed, that of the Tellico Plains and Farner 15' quadrangles (P.W.) was begun, that of the Elk Park No. 2 7½' quadrangle (T.V.A.) was completed, and that of the Bakersville No. 1 and Bakersville No. 2 7½' quadrangles (T.V.A.) was begun.

Texas.—In preparation for geologic mapping the survey of the Guadalupe Peak No. 2 quadrangle was completed. The survey of the Wildorado No. 1, Amarillo No. 2, and Dumas No. 3 15' quadrangles (P.W.) was completed, and that of the Longview No. 3 and Dumas No. 4 15' quadrangles (P.W.) was begun.

Utah.—The survey of Salt Lake County (P.W.) was continued, and that of the Theodore 30' quadrangle (P.W.) was begun.

Vermont.—In cooperation with the State geologist of Vermont the survey of the Guildhall 15' quadrangle was completed, and that of the Woodsville 15' quadrangle was begun.

Virginia.—The survey of the Pulaski and Waynesboro 15' quadrangles and the Richmond No. 3 and Richmond No. 4 7½' quadrangles was completed, and that of the Richmond No. 1 7½' quadrangle and the Mount Rogers and Mouth of Wilson 15' quadrangles was begun, in cooperation with the Conservation and Development Commission of Virginia, Geological Survey. The survey of the Fredericksburg-Spottsylvania Battlefield National Monument (P.W.) and the Balcony Falls and Amherst 15' quadrangles (P.W.) was begun.

Washington.—The survey of the Olympia 15' quadrangle (P.W.) was completed, that of the Mount Constance, Eatonville, and Metaline 30' quadrangles (P.W.) was continued, and that of the Fort Simcoe 30' quadrangle (P.W.) was begun.

West Virginia.—In cooperation with the Division of Subsistence Homesteads the survey of the Arthurdale Farm Project, near Reedsville, Preston County, was completed.

Wisconsin.—The survey of the Chippewa Falls 15' quadrangle (P.W.) was continued.

Wyoming.—For the Forest Service the survey of the Savery Creek quadrangle was completed. The survey of the Devils Tower National Monument (P.W.) was completed, and that of the Grand Teton National Park (P.W.) and Grand Encampment 30' quadrangle (P.W.) was begun.

WATER-RESOURCES BRANCH

The importance of water and of records related to the quantity, chemical quality, and availability of both surface and ground waters has become increasingly apparent during the year. The growth of the country in population with consequent increases in demands for water and especially the continued series of dry years which has culminated in the disastrous and widespread drought in 1934 have served to impress on all the people the controlling importance of

water in our surface streams and in underground basins in relation to many of man's activities. The Public Works Administration has found the information with respect to water to be invaluable in its study of projects of all classes and in all sections of the country and has relied on the records of the Geological Survey as a basis for its action on many projects.

Reliable information with respect to these supplies of water and to their fluctuations with variations in rainfall is essential to orderly, stable, and economic development along many lines and, therefore, to the national welfare. The work of the water-resources branch thus assumes a position of great importance in the economic affairs of the Nation.

The water-resources investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations were conducted for the following Federal bureaus through advance, transfer, or repay of funds:

Department of Agriculture:

Office of Experiment Stations

Weather Bureau

Forest Service

Bureau of Biological Survey

Department of the Interior:

Division of Subsistence Homesteads

Office of Indian Affairs

Bureau of Reclamation

National Park Service

Department of Justice: Bureau of Prisons

Department of the Navy: Bureau of Yards and Docks

Department of State

Department of War: Office of the Chief of Engineers

Federal Power Commission

Tennessee Valley Authority

Federal Emergency Administration of Public Works

States.—The following amounts were made available by States and municipalities for cooperative surface- and ground-water investigations. In addition to the results obtained directly from cooperation, it is estimated that data valued at over \$145,000 were furnished by cooperating officials.

Cooperative State and municipal funds available for work on water-resources investigations, fiscal year 1934

State	State funds available		Municipal funds available		Total
	Surface water	Ground water	Surface water	Ground water	
Arizona.....			\$3,200.00		\$3,200.00
Arkansas.....	\$0.13				.13
California.....	25,000.00		17,250.00	\$7,000.00	49,250.00
Colorado.....	16,000.00				16,000.00
Connecticut.....	6,000.00		100.00		6,100.00
Florida.....	3,021.63		1,500.00		4,521.63
Hawaii.....	14,684.08	\$7,091.58			21,775.66
Idaho.....	20,845.33				20,845.33
Illinois.....	5,400.00				5,400.00
Indiana.....	4,000.00		300.00		4,300.00
Iowa.....	5,514.00				5,514.00
Kansas.....	7,037.99				7,037.99
Louisiana.....			415.00		415.00
Maine.....	6,500.00				6,500.00
Maryland.....	8,099.87		1,724.75		9,824.62
Massachusetts.....	5,301.29		1,600.00		6,901.29
Michigan.....	1,800.00	2,294.28			4,094.28
Minnesota.....	5,108.00				5,108.00
Mississippi.....	1,000.00				1,000.00
Missouri.....	8,688.40		326.60		9,015.00
Montana.....	6,000.00				6,000.00
Nebraska.....	12,000.00	3,000.00			15,000.00
Nevada.....	800.00				800.00
New Hampshire.....	3,750.00				3,750.00
New Jersey.....	10,000.00	3,802.60			13,802.60
New Mexico.....	14,819.99	2,772.65			17,592.64
New York.....	15,914.90	2,000.00	5,287.66	4,400.00	27,602.56
North Carolina.....	4,500.00	200.00			4,700.00
North Dakota.....	100.00				100.00
Ohio.....	17,346.98		2,200.13		19,547.11
Oregon.....	24,575.76	1,022.66	866.73	500.00	26,965.15
Pennsylvania.....	20,085.73	1,500.00			21,585.73
South Carolina.....	1,750.00		399.37		2,149.37
Tennessee.....	11,012.52	1,000.00			12,012.52
Texas.....	21,635.87	15,285.95			36,922.82
Utah.....	5,500.00		119.82	6,571.23	12,191.05
Vermont.....	4,184.00				4,184.00
Virginia.....	19,000.00	994.86			19,994.86
Washington.....	11,126.95	300.00	5,846.06		17,273.01
West Virginia.....	3,000.00				3,000.00
Wisconsin.....	7,000.00				7,000.00
Wyoming.....	8,250.00				8,250.00
	366,354.42	41,264.58	41,136.12	18,471.23	467,226.35

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the commission to perform such field work as may be assigned to them by the commission. The operation of about 320 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 130 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operations under permits and licenses of the commission in connection with 100 projects. Examination and reports on applications for projects have been made for the commission as requested.

WORK OF THE YEAR BY DIVISIONS

The division of surface water conducts investigations of surface water, which consist of the measurement of the flow of rivers, conducted in the 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and

records of stage and other data are collected, from which the daily discharge of the rivers is computed. In this work 41 States, the Territory of Hawaii, and several Federal bureaus and individuals cooperated in the maintenance of the 2,941 regular gaging stations that were in service at the end of the year. Records for about 124 additional gaging stations were received, ready for publication, from Federal bureaus and from individuals.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for drilling wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year about 65 investigations relating to ground water and reservoir sites were in progress, and work was done in 28 States and the Territory of Hawaii, in cooperation with State or local governmental agencies, or on Public Works Administration Federal projects. In the hydrologic laboratory 383 samples of water-bearing material were analyzed.

The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health) so far as such use is affected by the dissolved mineral matter. The analysis (partial or complete) of 1,226 samples of water, including some for nearly all the studies of ground water in the different States, was completed during the year.

The work of the division of power resources comprised the preparation of monthly reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported, an annual report containing revised figures of the monthly production of electricity and consumption of fuel in 1933 previously published in the monthly reports, a report on the developed water power of the United States, and compilations of stocks of coal held by public-utility power plants for inclusion in reports of commercial stocks of coal

undertaken quarterly by the Bureau of Mines of the Department of Commerce. The annual report on the capacity of water wheels in water-power plants in the United States was released February 3, 1934, and the final report on the monthly and annual production of electricity for public use in 1933 was released April 30, 1934.

The division of water utilization investigates problems affecting the utilization and control of the waters of streams and performs administrative work relating to supervision and investigation of these problems by the field organization of the water-resources branch and of power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water.

CONSERVATION BRANCH

The functions of the conservation branch, including the classification of public and quasi-public lands with respect to mineral, water power, and agricultural value, and the technical supervision of mineral and power development on such lands, were increased in volume and scope during the fiscal year. Their performance, however, was seriously impaired by want of adequate funds, by consequent loss of experienced personnel, and by practical cessation of the normal inflow of basic data from field sources.

The following table indicates in part the dependence of public-land administration on land-classification phases of branch work and summarizes activity in the Washington office with respect to specific cases submitted in accordance with departmental procedure for technical report, review, or approval. The terms "gain" and "loss" signify, respectively, decrease and increase in the number of cases pending. Compared with 1933, this tabulation shows increase of 6 percent in cases received, decrease of 17 percent in cases acted on, and increase of 78 percent in cases pending at the end of the year.

General summary of cases involving land classification

Class of cases	Record for fiscal year 1934						Record since receipt of first case	
	Pending July 1, 1933	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1934	Gain or loss during fiscal year	Received	Acted on
General Land Office requests:								
General.....	307	1, 208	1, 515	1, 392	123	+184	2, 313	2, 313
Time extensions.....	10	78	88	77	11	-1	17, 294	17, 283
Oil development.....	19	686	705	651	54	-35	39	39
Concurrence.....								
Section 27 cases.....	3	1, 814	1, 817	1, 687	130	-127	11, 232	11, 102
Committee cases: Oil and potash.								
Applications for classification as to mineral:								
Oil.....	74	2, 344	2, 418	2, 274	144	-70	26, 156	26, 012
Miscellaneous.....	7	10	17	16	1	+6	917	916
Applications for mineral permits.....	78	1, 813	1, 891	1, 622	269	-191	59, 560	59, 291
Applications for mineral leases.....	5	141	146	135	11	-6	2, 018	2, 007
Applications for patent, potassium.....							124	124
Federal Power Commission cases:								
Preliminary permits.....	17	32	49	47	2	+15	315	313
Licenses.....							28	28
Determinations under section 24.....	22	66	88	81	7	+15	491	484
Applications for classification as to power resources.....	10	18	28	25	3	+7	531	528
Applications for agricultural classification.....	37	132	169	128	41	-4	1, 484	1, 443
Applications for rights-of-way.....	38	114	152	144	8	+30	6, 990	6, 982
Irrigation project reports.....	2	3	5	5		+2	938	938
Applications under enlarged homestead acts.....	16	151	167	100	67	-51	57, 940	57, 873
Applications under stock-raising-homestead acts.....	859	3, 023	3, 882	2, 073	1, 809	-950	142, 475	140, 666
Applications under Ground Water Reclamation Act.....	2	6	8	6	2		987	985
Indian Office requests for information.....		1	1	1			9, 548	9, 548
	1, 506	11, 640	13, 146	10, 464	2, 682	-1, 176		

MINERAL CLASSIFICATION DIVISION

The work of the mineral classification division was restricted rather closely during the year to office phases indispensable to appropriate departmental action on current applications for public-land use under the mineral-leasing laws or for disposition under the nonmineral-land laws. A few imperative case investigations were made in the field, however, and one regional survey of importance begun in 1933 was completed.

Types of office activity indicated in the general summary of cases involving land classification were increased during the year to include determinations pursuant to departmental circular no. 1303, whether in specific cases the grant of surface rights in Federal lands will tend seriously or substantially to impede prospecting and development under the mineral-leasing laws, and to include the drafting for the departmental committee of its recommendations of action on applications for extension of time for compliance with the terms of outstanding oil and gas prospecting permits and potash permits.

Availability of the results of geologic surveys made prior to 1934 permitted some progress in classifying the vast areas of public land withdrawn more than a quarter of a century ago for mineral examination and classification. Classifications effected include 482,840 acres as coal land, 593,834 acres as noncoal land, with a net reduction of outstanding coal withdrawals by 946,433 acres.

Summary of outstanding mineral withdrawals and classifications, June 30, 1934, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	With- drawn	Classified as coal land	With- drawn	Classi- fied as oil land	With- drawn	Classi- fied as oil shale land	With- drawn	Classi- fied as phos- phate land	With- drawn
Alaska.....		56,993							
Ariz.....	139,415								
Ark.....		61,160							
Calif.....	17,603	8,720	1,178,392						90,324
Colo.....	4,142,233	3,082,272	215,370		1,172,778	952,239			
Fla.....							66,706	120	
Idaho.....	11,520	4,603					276,239	270,036	
La.....			466,990	4,233					
Mont.....	6,442,830	19,254,927	1,336,697	67,651			279,944	3,833	
Nev.....	83,673								39,422
N. Mex.....	4,124,578	984,829							9,282,160
N. Dak.....	5,954,364	11,178,286	84,894						
Oreg.....	4,361	18,887							
S. Dak.....		250,093							
Utah.....	3,404,043	1,267,697	21,344,473		2,737,274	2,703,755	277,344	2,937	
Wash.....	691,801	141,444							
Wyo.....	2,260,604	6,741,748	541,777		2,328,370	406,003	989,133	25,293	
	27,277,025	33,051,659	5,168,593	71,884	6,238,422	4,061,997	1,889,456	302,219	9,411,906

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).

² Includes 13,578 acres withdrawn as helium reserve.

³ Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

Division activity precedent to administration of the mineral-leasing laws included primary findings of pertinent technical fact affecting the adjudication of 1,622 current filings for prospecting permit, of 135 current filings for lease, and of 2,290 conflicts or anticipated conflicts between mineral and nonmineral claimants; the technical review with ultimate concurrence in 651 approvals of assignment and authorizations of mineral lease or license; the preparation for the departmental committee of abstracts and recommendations affecting the grant of time extensions on 1,687 outstanding prospecting permits for oil and gas or potash; and the preparation and promulgation of definitions of the "known geologic structure" of six producing oil and gas fields, as follows:

Definitions of "known geologic structure", fiscal year 1934

State	Field	Date promulgated	Acres
Montana	North Bowes	Aug. 25, 1933	1,880
Do.	South Bowes	Aug. 25, 1933	3,240
Do.	Dry Creek	Jan. 6, 1934	6,081
New Mexico	North Eunice (additional)	Sept. 2, 1933	280
Wyoming	Lake Creek	Aug. 25, 1933	2,273
Do.	La Barge	Oct. 3, 1933	1,641

The aggregate area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1934, was 960,346 acres in California, Colorado, Montana, New Mexico, Oklahoma, Utah, and Wyoming.

POWER DIVISION

During the fiscal year 1934 the work of obtaining basic information as to the water-power resources of public lands and of making it available for use in the administration of the public-land laws was directed chiefly to its field phases. Field work made possible by funds allotted by the Public Works Administration was materially expanded, and long deferred surveys of the power resources of important streams were undertaken in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. These surveys involved about 1,400 linear miles of streams and included supplemental geologic or geophysical studies of foundation material and conditions at six dam sites in Colorado, Oregon, and Utah.

Office activities not indicated in the general summary of cases involving land classification resulted in additions of 148,714 acres to outstanding power reserves in 12 States, eliminations of 31,153 acres from such reserves in 8 States, and net increase of the total area of such reserves in 22 States to 6,800,371 acres. Field supervision of power projects for the Federal Power Commission involved investigation and report on 16 projects, construction and operation on 132 projects, and cost accounting on 3 projects.

Returns for the calendar year 1933 disclose the total installed capacity of the systems operated by the holders or users of rights-of-way for power purposes granted by the Secretary of the Interior as 5,855,000 horsepower. The total energy generated in that year was 9,182,000,000 kilowatt-hours, an increase of 28 percent over the output reported in 1932—an increase that is simply statistical, however, and due to the return for 1933 of certain items not previously returned rather than to any material increase in actual output. Revenues accrued from the use and occupancy of public lands under power permits and grants issued by the Secretary of the Interior aggregated

\$190,194 from 1912 to 1933, and \$15,145.31 additional has been assessed for the calendar year 1934. Accrued charges for unauthorized occupancy of public lands by power projects prior to the issuance of license therefor by the Federal Power Commission amount to \$111,826.58 additional, about \$12,000 of which is before the courts for adjudication.

AGRICULTURAL DIVISION

Although the number of applications currently received for agricultural classification, for designations under the stock-raising and enlarged homestead acts and Nevada ground-water act, and for approval of irrigation projects decreased about 9 percent compared with 1933, the number of cases pending on June 30, 1934, was 109 percent greater than on June 30, 1933.

Office activities not indicated in the general summary of cases resulted in the designation of 508,193 acres in 16 States as subject to the stock-raising homestead act, cancelation of prior designations under that act to the extent of 5,470,887 acres in 7 States, and net reduction of the outstanding designated area in 20 States to 119,339,-332 acres; the designation of 5,256 acres in 11 States as subject to the enlarged homestead acts, cancelation of prior designations under those acts to the extent of 15,089,655 acres in 4 States, and net reduction of the outstanding designated area in 14 States to 294,413,-685 acres; the inclusion of 8,607 acres in 8 States in public water reserves, exclusion of 1,080 acres in 4 States from such reserves, and net increase of the gross area reserved in 13 States to 494,728 acres; and the designation of 8,800 acres under the Nevada ground-water act, with increase of the aggregate area so designated to 1,729,495 acres. Liaison service was maintained for the Interior Department with the committee for acquisition of submarginal land, of the Federal Emergency Relief Administration, and considerable assistance was rendered to members and committees of Congress concerned with the framing and enactment of the Taylor grazing law (Public No. 482, 73d Cong.).

MINING AND OIL AND GAS LEASING DIVISIONS

The work of the mining and oil and gas leasing divisions consists of the exercise of supervisory jurisdiction over mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves.

In spite of an increase during the year of 877, or 14 percent, in the number of Federal properties under supervision, inspectional and regulatory activities, already substantially below the limit of prudent administration, were of necessity further reduced. In their stead remedial activities, required to eradicate the injurious consequences of insufficient Federal supervision in previous years, were undertaken

with funds provided for the purpose by the Public Works Administration.

Field supervision, exercised through 22 offices and suboffices in the public-land States and Alaska, was increased during the year by the issuance of Federal leases, licenses, and prospecting permits for 1,247 additional properties. In the same period leases, licenses, and permits for 368 properties were terminated.

Federal properties under supervision at the end of the fiscal year, indicated in detail in the summary of field operations by States, numbered 7,154 in 19 States and Alaska and involved an aggregate of 9,541,487 acres. They contained 4,236 productive oil and gas wells, 38 of which were completed during the year, 528 coal mines, 2 potassium mines, 1 phosphate mine, 3 sodium plants, 1 oil-shale plant, and a great variety of prospecting operations.

By order of the Secretary dated September 12, 1933, the supervisory function of these divisions was enlarged to include the receipt, for transmission to the General Land Office, of all remittances made in payment of rents and royalties accrued under mineral leases and prospecting permits involving public land and the maintenance of records showing the current status of each account.

Especial activity resulted from a departmental order dated July 12, 1933, requiring that on and after May 1, 1933, the Government royalty on petroleum be computed on the volume of production as determined by tank measurement based on 100 percent tank tables and calculated as barrels of clean oil of 42 standard United States gallons each; from departmental grants of drilling and production relief to numerous operators on Federal lands with corresponding increase of supervisory obligation to determine and assess the monthly charges due to the Government as compensation for any loss of royalty entailed; from departmental instructions of May 16, 1934, obligating supervisors to determine production proration between Federal lands and other lands in areas served by pipe lines occupying rights of way pursuant to the act of February 25, 1920 (41 Stat. 437), and to pass on the rates and terms of transportation and purchase of production in such areas; from increased submissions of proposed plans for the unit operation and development of oil and gas fields involving public land, for consideration and technical approval; and from cooperation with the Petroleum Administrative Board of the National Recovery Administration in facilitating throughout the public-land States the submission of the development plans for new pools required by article III, section 7, of the Code of Fair Competition for the Petroleum Industry.

In the field of mine supervision especial activity resulted from a marked increase of irresponsible trespass on Federal-owned coal lands, with the consequent starting of a large number of outcrop

fires and the filing of many complaints by royalty-paying lessees and permittees of total or partial loss of their coal market by reason of unauthorized unsupervised competition; and from the necessity for local surveys of coal supply and demand as basis for appropriate recommendations under departmental order of January 24, 1934, restricting the issuance of coal prospecting permits and leases to localities whose coal needs cannot feasibly be supplied by existing mines.

Mineral production during the year from lands under Federal leases, licenses, and prospecting permits and revenue accrued therefrom in the form of royalty, rental, or bonus are shown below:

Mineral production from public lands and revenues accrued therefrom, fiscal year 1934

State	Petroleum (barrels)	Natural gas (M cubic feet)	Gas gasoline (gallons)	Coal (short tons)	Potassi- um (short tons)	Sodium (short tons)	Phos- phate (short tons)	Accrued revenue
Alaska.....				100,347.10				\$8,408.37
Ala.....				106,796.00				10,679.60
Calif.....	13,276,129.07	36,573,146	58,907,584.00	5.00		45,048.00		2,048,161.49
Colo.....	417,341.07	1,030,944	16,609.00	313,675.93				75,697.63
Idaho.....				2,749.13			43,066.91	3,616.97
La.....	1,756.61	1,383,908	31,757.08					16,886.37
Mont.....	305,003.11	1,445,773		253,607.43				71,113.05
Nev.....								480.00
N.Mex.....	2,456,898.10	6,421,645	1,033,534.76	34,612.68	289,836.99	781.56		256,655.11
N.Dak.....				386,149.76				23,711.40
Okla.....	295,810.65		34,891.99					34,244.71
Oreg.....				86.50				221.63
S.Dak.....				2,574.26				427.53
Utah.....	2,850.73	35,860		710,768.70				92,420.01
Wash.....				37,551.33				3,755.13
Wyo.....	8,299,385.46	10,975,581	27,704,218.00	739,762.72				1,345,091.95
1934.....	25,055,174.80	57,866,857	87,728,594.83	2,688,686.54	289,836.99	45,829.56	43,066.91	3,991,570.95
1933.....	24,662,589.46	56,637,196	91,549,635.62	2,953,780.00	173,563.16	37,314.00	1,643.14	3,648,816.65

INDIAN LANDS

On behalf of the Office of Indian Affairs technical supervision of mineral development was continued in 1934 on tribal and restricted allotted lands within the limits of numerous Indian reservations. Oil and gas supervision involved 4,668 leaseholds, 4,588 wells, and aggregate royalty and rental accruals of \$1,817,886.10 for Indian beneficiaries in 7 States and in 27 different tribes, and the drafting of a new form of lease for restricted lands designed to afford the lessor a greater measure of protection and of participation in leasehold revenues than heretofore. Mining supervision involved 40 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of \$247,367.48 during the year; 42 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes acreage in Oklahoma, with aggregate production of 388,094 tons of coal and royalty accruals of \$25,805.61; 13 agency coal mines in Arizona, Colorado, Montana, New Mexico, North Dakota, and Utah; and special investigations of gold occurrence on land under lease application in the Hoopa Valley Reservation, Calif.

NAVAL PETROLEUM RESERVES

On behalf of the Navy Department, supervision was continued during the year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Reserve No. 3, in Wyoming. Production from the California reserves aggregated 3,720,735.36 barrels of petroleum, 4,328,047,000 cubic feet of natural gas, and 14,440,117 gallons of natural-gas gasoline, having an aggregate royalty value of \$682,528.15.

PUBLIC WORKS PROJECTS

Throughout the greater part of the year much of the regular work of the conservation branch was subordinated to related activities undertaken with funds allotted by the Public Works Administration. Under 23 project allotments amounting to \$11,764 expenditures of \$9,819.13 were made during the year for repairs and physical betterments at the camps maintained for branch employees at Taft, Calif., and Midwest, Wyo. Under 9 project allotments amounting to \$200,000 expenditures of \$59,256.09 were made for the proper plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands in the West and thereafter improperly abandoned or merely deserted. Under 6 project allotments amounting to \$428,200 expenditures of \$168,288.53 were made in extinguishing and controlling coal-outcrop fires and in filling, bulkheading, or otherwise safeguarding abandoned mine or prospect openings on publicly owned coal lands in the West and on Indian-owned coal lands and lead and zinc lands in Oklahoma, and in subsurface studies of oil and gas occurrence in Indian-owned lands in Oklahoma. Under 11 project allotments amounting to \$250,000 expenditures of \$99,155.28 were made for utilization surveys of the power and storage resources of important rivers and creeks in nearly all the public-land States. Except for those involving camp rehabilitation the projects undertaken were planned for continuance during a period of 18 months and completion prior to June 30, 1935. Many of the oil and gas projects involved the letting of contracts under which operations were not begun until after the end of the fiscal year 1934.

SUMMARY OF FIELD OPERATIONS BY STATES

Alabama.—Inspected oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised one coal lease.

Alaska.—Supervised 4 leases, 2 licenses, and 18 prospecting permits for coal and 101 prospecting permits for oil and gas.

Arizona.—Supervised 9 power projects and completed 206 miles of stream-utilization surveys on Williams, Little Colorado, and Verde Rivers. In cooperation with the University of Arizona and the United States Forest Service con-

tinued surveys of the grazing and agricultural resources of the State. Supervised on public land 6 prospecting permits for potassium, 6 prospecting permits for sodium, and 63 prospecting permits for oil and gas; on Indian land, 1 lease for oil and gas.

Arkansas.—Supervised 1 power project. Inspected oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 9 prospecting permits for oil and gas.

California.—Examined the Big Bar coal field, Trinity County, and one tract in Sonoma County for mineral classification. Supervised 44 power projects and completed 310 miles of stream-utilization surveys on Sacramento, McCloud, and Kern Rivers and Putah Creek, including Kennett, Isabella, and Monticello reservoir sites and Kennett, Bakersfield, Democrat Springs, and Isabella dam sites. Continued detailed studies of grazing conditions in Mono Lake and Owens Valleys in cooperation with the city of Los Angeles. Supervised on public land 4 leases and 2 prospecting permits for potassium, 16 prospecting permits for sodium, 3 prospecting permits for coal, 215 leases and 697 prospecting permits for oil and gas; and on naval petroleum reserves 24 leases for oil and gas.

Colorado.—Made structural examination of Mancos Divide gas field, Montezuma County, for mineral classification and leasing-law administration, and geologic surveys of an area of burning coal near Coalmont, Jackson County, precedent to the adoption of measures to extinguish or control the fire. Supervised six power projects and completed 50 miles of stream-utilization surveys on Gunnison, Roaring Fork, and San Juan Rivers, including the Trujillo reservoir site on the San Juan. Supervised on public lands 79 leases, 12 licenses, and 40 prospecting permits for coal, 1 prospecting permit for potassium, and 28 leases and 459 prospecting permits for oil and gas; and on Indian lands 6 leases for oil and gas.

Florida.—Inspected oil and gas prospecting operations throughout the State and examined one tract each in Liberty, Hamilton, and Lee Counties for mineral classification.

Idaho.—Supervised 19 power projects and completed 145 miles of stream-utilization surveys on Snake River, Henrys Fork, and Priest River. Completed reconnaissance studies of grazing capacities and conditions in the proposed Garden Creek and Lemhi Valley grazing districts. Supervised 11 prospecting permits for coal, 2 leases for phosphate, and 77 prospecting permits for oil and gas.

Kansas.—Examined one tract in Riley County for land classification. Supervised 13 prospecting permits for oil and gas.

Louisiana.—Inspected oil and gas prospecting operations throughout the State and examined one tract in Catahoula Parish for mineral classification. Supervised 11 leases and 1 prospecting permit for oil and gas.

Mississippi.—Inspected oil and gas prospecting operations throughout the State and examined two tracts in George County for mineral classification.

Montana.—Supervised three power projects and completed 140 miles of stream-utilization surveys on Kootenai, Flathead, and Blackfoot Rivers. Completed investigation of the grazing resources of the Mizpah-Pumpkin Creek Grazing Reserve. Supervised on public land 90 leases, 22 awarded leases, 66 licenses, and 44 prospecting permits for coal, 5 leases for phosphate rock, and 82 leases and 643 prospecting permits for oil and gas; and on Indian land 1 lead-silver-gold lease and 50 leases for oil and gas.

Nebraska.—Supervised one prospecting permit each for potassium and for oil and gas.

Nevada.—Supervised five power projects and completed 117 miles of stream-utilization surveys on Little Humboldt and Muddy Rivers. Supervised 4 prospecting permits for coal, 1 lease for phosphate, 10 prospecting permits for potas-

sium, 1 lease and 5 prospecting permits for sodium, and 59 prospecting permits for oil and gas.

New Mexico.—In cooperation with the geologic branch completed geologic survey of parts of Sandoval and Rio Arriba Counties for coal classification. Completed 125 miles of stream-utilization surveys on Chama, Gila, and San Francisco Rivers and Rio Grande. Supervised on public land 22 leases and 23 prospecting permits for coal, 9 leases and 158 prospecting permits for potassium, 10 prospecting permits for sodium, 22 prospecting permits for sulphur, and 94 leases and 1,195 prospecting permits for oil and gas; and on Indian land all agency coal mines and 7 leases for oil and gas.

North Dakota.—Supervised 72 leases, 14 authorized leases, 18 licenses, and 1 prospecting permit for coal, and 20 prospecting permits for oil and gas.

Oklahoma.—Supervised on public land 17 leases and 14 prospecting permits for oil and gas; and on Indian land 42 leases, 3 pending leases, 12 prospecting permits, and 6 pending permits for coal, 40 leases for lead and zinc, and 4,563 leases for oil and gas. Bored 103 auger holes and made 207 water analyses in a study of sub-surface pollution involving appraised damages of \$100,000 to 24 Indian allotments.

Oregon.—Examined one tract in Multnomah County for coal classification. Supervised 37 power projects and completed 51 miles of stream-utilization surveys on the Hood, Willamina, and Umatilla Rivers and Gales and Catherine Creeks, including numerous small reservoir sites. Supervised 1 lease and 7 prospecting permits for coal, 1 lease for oil shale, and 46 prospecting permits for oil and gas.

South Dakota.—Supervised 4 leases, 1 license, and 2 prospecting permits for coal and 26 prospecting permits for oil and gas.

Utah.—Completed detailed geologic survey of Petroleum Reserve No. 7, in Washington County, for mineral classification and leasing-law administration and examined one tract in Iron County, for coal classification. Began a systematic survey of the grazing resources of grazing district no. 4, in the west-central part of the State. Supervised seven power projects and completed 72 miles of stream-utilization surveys on Huntington, Cottonwood, Pleasant, Ephraim, and Manti Creeks. Supervised 37 leases, 2 licenses, and 86 prospecting permits for coal, 3 prospecting permits for sodium, 42 prospecting permits for potassium, and 11 leases and 535 prospecting permits for oil and gas. Supervised on Indian land one lease for oil and gas.

Washington.—Supervised 12 power projects and completed 93 miles of stream-utilization surveys on Nooksack and Toutle Rivers, Clark Fork, and Sheep Creek. Supervised 17 prospecting permits for coal, 1 authorized lease and 1 prospecting permit for sodium, and 8 prospecting permits for oil and gas.

Wisconsin.—Supervised one power project.

Wyoming.—Examined 9 square miles in Natrona County for coal classification and 4 square miles in Goshen County for phosphate classification. Supervised 4 power projects and completed 98 miles of stream-utilization surveys on Bear, Laramie, and Green Rivers. Supervised on public land 44 leases, 21 licenses, and 49 prospecting permits for coal, 2 prospecting permits for sodium, 422 leases and 1,270 prospecting permits for oil and gas; and on Indian land 40 leases for oil and gas. Made 22,970 determinations of oil gravity, 55 analyses of oil, 35 analyses of natural gas, and 295 analyses of oil-field waters.

WORK ON PUBLICATIONS

Texts.—The book publications of the year in the regular series numbered 47, covering 6,602 pages. Besides these publications, 46 brief papers in mimeographed form were issued as memoranda for the

press. During the year 19,007 pages of manuscript were edited and prepared for printing, and 2,234 galley proofs and 7,434 page proofs were read and corrected. Indexes were prepared for 29 publications, covering 5,039 pages. Copy and proof or stencils for 1,297 pages of multigraph and mimeograph matter were read.

Illustrations.—The section of illustrations prepared 2,002 drawings and photographs, transmitted 456 illustrations to accompany 26 reports, received and examined 515 proofs, and examined 32 editions. The work included considerable drafting for the Public Works Administration.

Geologic editing and drafting of maps and illustrations.—The geologic map of Colorado, scale 1:500,000, was prepared for engraving and reached first plate proof of the boundaries. Letter symbols for this map were prepared for engraving, and the explanation was prepared for typesetting. The geologic map of Texas, scale 1:500,000, was prepared for engraving and the explanation prepared for typesetting. The printing of the geologic map of the Valley of Virginia, scale 1:250,000, and of the map showing mineral resources of the Tennessee Basin, scale 1:500,000, was completed. The maps for the Somerset-Windber (Pa.) and Montevallo-Columbiana (Ala.) folios were approved for printing. The geologic maps of the Hollidaysburg-Huntingdon (Pa.) folio reached first plate proof. Illustrations for 16 papers, ready for publication, were edited, and 113 drawings were made for papers by geologists for publication by State geological surveys or other organizations.

Engraving and printing.—During the fiscal year 80 newly engraved topographic maps were printed, including 6 revised maps (of this number 7 were completed under the Public Works allotment), and 8 new State and other maps and 3 special maps were photolithographed and printed, making a total of 91 new maps printed and delivered. Corrections were engraved on the plates of 115 maps. Reprint editions of 150 engraved topographic maps and 7 photolithographed State and other maps were printed and delivered. In addition, 43 new topographic maps had been engraved and were in press June 30, including 18 under Public Works allotment, and the engraving of 6 other new topographic maps was nearly completed, including 2 under Public Works allotment. Of new and reprinted maps, 248 different editions, amounting to 612,115 copies, were delivered.

A large amount of work was done for 58 other units of the Government and 2 State Governments. This work included many reprints, and the charges for it amounted to about \$141,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

Of topographic maps, geologic maps, and contract and miscellaneous work of all kinds, a grand total of 2,214,728 copies were printed and delivered.

The output of the photographic laboratory consisted of 8,588 negatives (including 3,763 wet plates for photolithographs, 882 wet plates for photographic prints, 12 paper negatives, 988 dry plates, 328 lantern slides, and 2,615 field negatives developed), 21,044 prints (including 2,699 maps and diagrams, 16,983 photographs for illustrations and records and 1,362 bromide enlargements), 3,154 zinc plates, 282 intaglio etchings, 4 celluloid prints, and 167 prints mounted.

Distribution.—A total of 295 publications, comprising 47 new books and pamphlets, 91 new or revised topographic and other maps, and 157 reprinted topographic and other maps, were received by the division of distribution during the year. A number of special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 102,291 books and pamphlets and 612,115 topographic and other maps, a grand total of 714,406.

The division distributed 142,611 books and pamphlets, 1,575 geologic folios, and 630,741 maps, a grand total of 774,927, of which 1,358 folios and 457,965 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were \$35,101.52, including \$34,705.33 for topographic and geologic maps and \$396.19 for geologic folios. In addition to this \$1,621.78 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$36,723.30.

LIBRARY

A Civil Works Administration project was set up for the library December 18, 1933, and about 50 workers were employed on a rehabilitation program. Much worth-while work in cataloging the Kunz collection on precious stones, inventorying the library, mending more than 3,000 books, etc., was accomplished before the closing up of the Civil Works Administration on April 28, 1934. The inventory showed a count of 186,900 books in the library. Since June 1, 1934, this special work has been continued under the Emergency Relief Administration. The accessions during the year comprised 9,366 books, pamphlets, and periodicals and 755 maps. The library was used by 11,182 readers, nearly half of them not members of the Survey, and the loans for use outside of the library numbered 13,910. Work on the bibliography of North American geology was continued. The library facilities are being used in preparing a bibliography of foreign geology for the Geological Society of America and an annotated bibliography of economic geology for the National Research Council.

SUMMARIES OF BUREAU REPORTS

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	Funds available				Obligations			Balance
	Amounts ap- propriated or transferred	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities	Total	
		Made	To be made					
APPROPRIATIONS								
Salaries.....	\$125,000.00		\$12,121.02	\$137,121.02	\$112,821.56	\$23,433.02	\$136,254.58	\$886.44
Topographic surveys.....	450,000.00	\$161,692.28	65,272.31	676,964.59	568,161.68	28,288.95	596,450.63	1 80,513.96
Geologic surveys.....	300,000.00	15,161.46	25,636.91	340,798.37	310,659.70	23,732.31	334,392.01	6,406.36
Volcanologic surveys.....	12,500.00			12,500.00	5,684.76	1,864.09	7,548.85	4,951.15
Alaskan mineral resources.....	30,000.00	4,815.19	1,482.70	36,297.89	30,540.99	2,339.76	32,880.75	3,417.14
Gaging streams.....	540,000.00	232,371.25	199,830.87	972,202.12	781,278.41	26,344.86	807,623.27	2 164,578.85
Classification of lands.....	100,000.00	2,346.13	7,708.57	110,114.70	99,403.69	6,169.33	105,573.02	4,541.68
Printing and binding.....	110,000.00	912.54		110,912.54	19,727.30	56,185.24	75,912.54	3 35,000.00
Preparation of illustrations.....	15,000.00	1,837.10		16,837.10	16,590.12	59.26	16,649.38	187.72
Geologic and topographic maps.....	85,000.00	116,786.68	28,560.52	230,347.20	207,986.18	11,476.75	219,462.93	10,884.27
Mineral leasing.....	225,000.00	17,605.67	15,629.46	258,235.13	210,174.39	13,121.08	223,295.47	34,939.66
	4 1,992,500.00	553,528.30	356,302.36	2,902,330.66	2,363,028.78	193,014.65	2,556,043.43	346,287.23
TRANSFERS								
Federal Power Commission (act Feb. 17, 1933), 1934.....	700.00			700.00	104.92	11.39	116.31	583.69
Flood control, Mississippi River and tributaries (War Department, act Feb. 14, 1931).....	1 1,310.30	146.43		1,456.73	587.58	869.15	1,456.73	0
Irrigation, Indian reservations (reimbursable; act Feb. 17, 1933), 1934.....	800.00			800.00	479.69	280.01	759.70	40.30
Irrigation, San Carlos and Florence-Casa Grande projects, Arizona (reimbursable; act Feb. 17, 1933), 1934.....	2,750.00			2,750.00	1,894.37	823.46	2,717.83	32.17
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 14, 1931).....	1 478.57	11.15		489.72	471.83	17.89	489.72	0
Maintenance and improvement of existing river and harbor works (War Department, act Apr. 22, 1932).....	1 4,093.50	349.40		4,442.90	4,442.90		4,442.90	0
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 17, 1933).....	21,034.00	10.25	208.24	21,252.49	15,679.96	4,104.56	19,784.52	1 1,467.97
National industrial recovery, Interior Department, Geological Survey, 1933-35.....	4,497,164.00	17,269.82	15,510.45	4,529,944.27	2,015,434.87	217,535.04	2,232,969.91	1 2,296,974.36
Operating and care of canals and other works of navigation (War Department, act Feb. 17, 1933).....	2,800.00			2,800.00	1,344.17	1,069.06	2,413.23	1 386.77
Operation and conservation of naval petroleum reserves (Navy Department, act Feb. 17, 1933), 1934.....	37,582.00	1,790.34	325.58	39,697.92	38,363.78	899.96	39,263.74	434.18
Supervising mining operations on leased Indian lands (act Feb. 17, 1933), 1934.....	56,800.00	2,664.21	1,743.05	61,207.26	59,339.16	1,898.10	61,207.26	0

Funds available, expenditures, and obligations incurred by Geological Survey, fiscal year ended June 30, 1934—Continued

	Funds available			Obligations			Balance	
	Amounts ap- propriated or transferred	Repayments on account of work performed		Total	Disbursements	Outstanding liabilities		Total
		Made	To be made					
TRANSFERS—continued								
Wapato Irrigation and Drainage District, Washing- ton (reimbursable; act Feb. 17, 1933), 1934	\$575. 00			\$575. 00	\$239. 70	\$313. 35	\$553. 05	
Waterways treaty, United States and Great Britain (State Department, act Mar. 1, 1933), 1934	48, 200. 00	\$52. 77	\$122. 50	48, 375. 27	35, 390. 83	11, 160. 34	46, 551. 17	
Working fund, Department of the Interior, Civil Works	146, 150. 00			146, 150. 00	130, 865. 56	7, 740. 38	138, 605. 94	
Working fund, Department of the Interior, Public Works (Agriculture, Public roads)	75, 000. 00	628. 08	833. 19	76, 461. 27	33, 282. 74	301. 29	33, 584. 03	
Working fund, Department of the Interior, Public Works (Agriculture, Weather Bureau)	46, 900. 00		73. 50	46, 973. 50	19, 079. 64	5, 357. 39	24, 437. 03	
Working fund, Department of the Interior, Public Works (Army Engineers)	11, 900. 00			11, 900. 00	4, 240. 04			
Working fund, Department of the Interior (General Land Office)	11, 900. 00			11, 900. 00				
Working fund, Department of the Interior, Public Works (Mississippi Valley Committee)	8, 000. 00			8, 000. 00	4, 754. 90	1, 331. 48	6, 086. 38	
Working fund, Department of the Interior, Public Works (Bureau of Reclamation)	10, 000. 00		222. 50	10, 222. 50	8, 171. 61	1, 157. 02	9, 328. 63	
Working fund, Department of the Interior, Public Works (advance for water-resources branch supplies and materials)	5, 000. 00			5, 000. 00	612. 50	2, 797. 50	3, 410. 00	
Working fund, Department of the Interior (Tennessee Valley Authority)	170, 140. 00	4. 59	6, 199. 34	176, 343. 93	125, 093. 05	47, 703. 66	172, 796. 71	
Total	5, 159, 277. 37	22, 927. 04	25, 238. 35	5, 207, 442. 76	2, 499, 873. 80	318, 055. 76	2, 817, 929. 56	
Grand total	7, 151, 777. 37	\$ 576, 455. 34	\$ 381, 540. 71	\$ 8, 109, 773. 42	\$ 4, 862, 902. 58	\$ 511, 070. 41	\$ 5, 373, 972. 99	
							2, 735, 800. 43	

¹ \$50,000 of this balance continued available for expenditure during the fiscal year 1935.² \$163,000 of this balance continued available for expenditure during the fiscal year 1935.³ This balance continued available for expenditure during the fiscal year 1935.⁴ In addition to these appropriations, there was an allotment of \$9,345.80 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.⁵ Expenditure of these appropriations was restricted by the Bureau of the Budget, which imposed a "cash withdrawal limitation" of \$1,496,212 during the fiscal year.⁶ Balance unobligated June 30, 1933, and continued available for expenditure in the fiscal year 1934.⁷ Balance unobligated June 30, 1934, and continued available for expenditure in the fiscal year 1935.⁸ Included in these amounts is \$454,340.52 covering work performed by Geological Survey units for other Geological Survey units; supplies furnished by one branch to another; credits to appropriations on account of impounded salaries which have been released; adjustment vouchers between transferred funds and Geological Survey appropriations; and other adjustments necessarily reported in combining totals but otherwise a duplication.

Classification of obligations incurred by the United States Geological Survey during the fiscal year ended June 30, 1934

	Salaries	Topo- graphic surveys	Geologic surveys	Volcan- ologic surveys	Alas- kan mineral re- sources	Gaging streams	Classifi- cation of lands
Personal services.....	\$106,968	\$1,161,136	\$356,866	\$5,725	\$23,048	\$809,272	\$85,682
Supplies and materials.....		20,190	5,169	115	153	99,780	203
Storage of motor cars.....		901	397			415	43
Communication service.....		1,497	239	2	19	4,280	84
Travel expenses.....		301,794	38,713	8	5,919	117,778	4,911
Transportation of things.....		67,025	6,380	34	205	27,973	429
Printing, binding, photographing, etc.		67,209	3,467		348	4,579	146
Heat, light, power, water, and elec- tricity.....		272	143		81	409	
Rents.....		373		1		5,922	
Repairs and alterations.....		9,452	860	102	146	41,324	57
Special and miscellaneous current ex- penses.....		387	194			1,711	21
Equipment.....		163,794	7,692		69	111,324	111
Structures.....				627		76,705	
Impoundments of compensation deduc- tions and vacancy savings.....	29,287	75,614	34,787	2,135	2,652	28,543	10,176
Miscellaneous transfers and adjust- ments.....		139,593	10,889		241	234,000	3,728
Total.....	136,255	2,009,237	465,796	8,749	32,881	1,564,015	105,591

	Printing and binding	Prepara- tion of illustra- tions	Geologic and topo- graphic maps	Mineral leasing	Civil Works projects	Total
Personal services.....		\$15,109	\$175,465	\$432,942	\$51,274	\$3,223,487
Supplies and materials.....		512	26,918	11,770	4,387	169,197
Storage of motor cars.....				111		1,867
Communication service.....			2	2,578	272	8,973
Travel expenses.....			102	29,762	30,256	529,243
Transportation of things.....			41	2,534	1,523	106,144
Printing, binding, photographing, etc.	\$75,043	266	7,798	378	26,093	185,327
Heat, light, power, water, and electricity				4,092		4,997
Rents.....				1,076	247	7,619
Repairs and alterations.....			396	38,384	281	91,002
Special and miscellaneous current ex- penses.....				557	128	2,998
Equipment.....		28	3,425	8,710	24,145	319,298
Structures.....				11,673		89,005
Impoundments of compensation deduc- tions and vacancy savings.....		692	12,691	16,495		213,072
Miscellaneous transfers and adjustments..	870	42	300	32,081		421,744
Total.....	75,913	16,649	227,138	593,143	138,606	5,373,973

NOTE.—In addition to the above amounts, there was expended directly by cooperating agencies \$72,242 for topographic surveys and \$244,547 for stream gaging.

OFFICE OF EDUCATION

(BESS GOODYKOONTZ, Acting Commissioner)

I. GENERAL STATEMENT

1. CHANGES IN THE ADMINISTRATIVE ORGANIZATION

THE COMMISSIONERSHIP

In May of this year Commissioner of Education George F. Zook resigned to become Director of the American Council on Education, his resignation to become effective on June 30. At the same time announcement was made of the appointment to the commissionership of John Ward Studebaker, superintendent of schools of Des Moines, Iowa, who will take office September 1.

The year of Dr. Zook's incumbency of the commissionership was a particularly important one for education and educational agencies. The effects of the depression were still weighing heavily on the schools, and the problems of adjustment were critical. The relation of education to the whole program of economic recovery was stated by Dr. Zook in this way:

Today, from the President to the humblest citizen there is a common agreement that education, widespread and up to date, holds the key to our national problems. On education depends all of our progress in the development of the production and distribution of material goods. To education we must look for vision and balance in our social life. In other words, our provision for education, in its broadest sense, is the greatest assurance to the American people of an opportunity for an abundant life.

Because of the close connection of education to the activities of many of the Government agencies engaged in phases of the recovery program, Commissioner Zook attempted to cooperate in every possible way with such Government programs. Illustrations of this include the Public Works Administration in its school-building activities, the N.R.A. in whatever codes affect the schools, and the C.C.C. in the educational programs in the camps. Descriptions of these cooperative activities as well as accounts of the continued research and service program of the office are given on the following pages.

UNION OF TWO FEDERAL EDUCATION AGENCIES

In October 1933 the duties and functions of the Federal Board for Vocational Education, which was created as a separate organization in 1917, were transferred to the Office of Education under the Commis-

sioner of Education, and the officers and employees of the Board became an integral part of the Office of Education. The Secretary's order effective October 10 carried out the terms of President Roosevelt's Executive order of June 10, which specified that "the functions of the Federal Board for Vocational Education are transferred to the Department of the Interior, and the Board shall act in an advisory capacity without compensation."

In announcing the transfer of the functions of the Federal Board for Vocational Education, Secretary Ickes said:

This transfer of the functions of the Board is not to be interpreted as any curtailment of the activities of the Federal Government in the field of vocational education. Both Dr. George F. Zook, the Commissioner of Education, and I have long been deeply interested in vocational education studies and efforts, and we both propose to promote the development of this highly important part of the field of education vigorously.

Emphasizing the importance of service to local school officers in the conduct of their total education program, the Commissioner, in accepting the new responsibilities, said:

I wish to assure you that I have a deep sense of the importance of this added responsibility. I will, to the best of my ability, promote the cause of vocational education vigorously and wisely. I trust that this union of educational forces in the Federal Government will increase the effectiveness of the service which the Federal Government renders to the States and local communities in the conduct of their educational programs.

Upon the transfer of vocational education functions to the Office of Education the staff of the Board became a separate division within the Office of Education under the immediate supervision of the former director of the Board, who was appointed Assistant Commissioner for Vocational Education. The rest of the Office, which was the former Office of Education, continues under the direction of the Assistant Commissioner of Education. Shortly after this combination was ordered the work in connection with mails and files, supplies, equipment, personnel, and accounting of the two formerly separate organizations was combined in the administration division under the general direction of the chief clerk and the work in connection with publications was combined in the editorial division of the Office of Education. No other changes in organization have been made up to the present time.

2. IMPORTANT EDUCATION PROBLEMS OF THE YEAR

CURTAILMENT OF EDUCATIONAL OPPORTUNITIES

In communities of 5,000 and under the opportunities for attendance in elementary schools returned, in most school districts, to near normal. This was made possible through financial aid from Federal sources. The restoration was not fully brought about, however, until

the second semester as, in the first half of the year, aid was extended only to communities of 2,500 and under. Even so, in some States there was not full opportunity for many children recently emancipated from labor, for the Federal grants permitted no increase in teachers nor in number of pupils enrolled.

In larger cities few if any schools were closed for the year but in many cases a month or more was lopped from the school term. To meet the financial situation a host of teachers worked at reduced and often greatly reduced pay. In many communities funds were raised by private subscription or a tuition was charged for those who could pay. The citizens were determined that the schools should be kept open as far as possible and the teachers did their share, and more, to meet the situation.

Even where there has been no limitation of opportunity to attend school it should not be overlooked that in a certain percentage of schools there has occurred a loss of some privileges in that certain activities pertaining to general culture and the use of leisure, such as art and music, have been dropped from the curriculum. It would seem as if, at the present day, these activities deserved to be stressed even more than formerly and it is to be hoped that local boards will take second thought as to their importance in modern life. In some instances the health service of the school has been crippled or abandoned, which is hardly in accordance with the principle that health is the first objective of education.

In the realm of higher education the opportunities for schooling were, in most instances, available although many colleges and universities have labored under financial difficulties. The problem with students and their parents was that of meeting tuition fees and living expenses. Present conditions have, of course, greatly reduced the opportunity for self-help through student employment and many ambitious young people who would gladly have earned their way found that way doubly barred. The attempt to meet this situation by Federal funds, to be used in furnishing suitable types of work for needy students, has been of help, but it is not an altogether simple matter to arrange for such employment. The situation of the seeker after higher learning is by no means wholly relieved although thousands of worthy students have thus been enabled to pursue their studies.

YOUTH PROBLEMS

During this present period of unemployment, the opportunities for youth to obtain work are meager to a degree not experienced in previous periods of economic depression. The codes of fair competition operate properly to give jobs to adults. Continuation schools have largely ceased to exist. Apprenticeship opportunities are meager indeed.

Two and a quarter million young people reach the age of employability each year. Since October 1929, more than 10 million have reached the employable age. Other millions below 21 years when the depression began are now between 22 and 26. From these 16 million young people, 18 to 25 years of age, are recruited the increasing army of transients, the pathetic idlers loafing on the street corners of every village and city in the country, and the startlingly long list of names on the rosters of our penal institutions. It seems imperative that something more comprehensive than the Civilian Conservation Corps should be worked into the national recovery machinery of government for these millions of young people.

In April 1934, a preliminary conference with representatives of the various governmental agencies carrying on some activities in the interest of youth was called by the Commissioner of Education. With the unanimous approval of these representatives and with the aid of funds provided for that and similar purposes by the General Education Board of New York, a larger conference of about 70 people was called by the Commissioner on June 1 and 2. At this conference persons from all sections of the country interested in (a) employment, (b) education and guidance, and (c) leisure-time activities worked out a statement of basic principles which should guide the development of a program for youth.

They also outlined the activities which were thought to be essential for such a program. They furthermore recommended that, in close relation with the Office of Education, a commission should be set up to study the questions further, and to do what it could to carry out a suitable program in the interest of youth.

The Commissioner of Education subsequently appointed three members of the staff of the Office of Education as a continuing committee on out-of-school youth.

FINANCING EDUCATION

During 1933-34 education was struggling under a most distressing financial load. While the numbers of children and youth demanding education continued to increase rapidly; while this increase came at the most expensive levels, namely, in the high schools and post-high-school courses; and while the unemployment among both parents and youth added to the variety and urgency of the demands for education, the budgets for education were severely cut. Not only was the building of schoolhouses almost completely stopped, but other items, intimately associated with the service of education, were severely curtailed. Needed school books were not bought, teachers of many subjects which are mistakenly regarded by some boards of education as nonessential, were dismissed, other teachers were dismissed, thus necessitating larger numbers of children per room, teachers' salaries

were disproportionately reduced in many places, and finally to come within the reduced budgets, school terms were shortened or teachers kept schools open without pay.

In such a critical situation the Office of Education has naturally been deeply concerned. It has sought in every way possible to cooperate in checking the tendency to cut educational budgets unduly, and to find sources of financial aid. Cooperating with the American Council on Education, it aided in the Conference on the Crisis in Education called by President Hoover in January 1933. As a result of this conference a movement was set on foot to establish in many communities of the country Citizens Councils on Constructive Economy. These are proving effective bulwarks against unreasonable slashing of school budgets.

In August 1933, the Commissioner of Education called a conference to canvass the question of how the Federal Emergency Relief Administration might incorporate into its work-relief program measures that would aid education. Representatives of education at all levels as well as representatives of the Federal Emergency Relief Administration participated. Out of that conference grew the proposals which resulted in the creation of the Education Division of the Federal Emergency Relief Administration, through which has been administered the relief work for rural schools, nursery schools, adult education both vocational and general, and for college students.

It was recognized, however, that the financial needs of schools and colleges could not be met most effectively from funds appropriated for relief. Therefore, it was desired to have the Congress give thorough consideration to the needs of education. Accordingly, the Commissioner of Education took the initiative in developing a program of Federal legislation for the financial aid of education. In November 1933, a small group of leaders was called together by the Commissioner. This group called a conference after three meetings, adopted a legislative program, and appointed a special committee to do what might be done to aid in the passage of the proposed legislation.

While the bills sponsored by this large conference were not passed by the Congress, it is believed that significant progress was made toward a better understanding and a more sympathetic attitude by members of the Congress with respect to the problems involved.

EDUCATION PROGRAMS FOR THE UNEMPLOYED

During the past year the condition of widespread unemployment has presented difficult problems in the field of education, more particularly in the field of vocational education.

It may be noted that the mandate under which the Federal Office of Education and the cooperating State vocational education staffs administer vocational education funds is, in the phraseology of the

Federal act, a mandate to safeguard the use of such funds under public supervision and control, so as to insure that they shall be used to fit workers for and keep them fit for useful employment in industry, agriculture, and the home. The theory underlying this statutory mandate is that only workers fit for employment can be employed under any conditions and that labor should not be permitted to continue unemployed in any period—either of normal activity or depression or of recovery—for the reason that training has not been made available to render displaced unemployed workers fit for employment in such jobs as become available.

Employers and employment agencies have found that even during the period of extreme depression and in larger measure as we have entered upon recovery in different lines of economic activity the unemployed worker has in thousands of instances not received the training required to render him fit for employment in any available job. To the extent that it can be attributed to the failure of the community, to provide the training needed to qualify workers for employment under the rapidly changing conditions of work unemployment must be recognized as being a responsibility of vocational education. Provision of adequate vocational training, furthermore, is a condition of recovery itself, since neither industry nor agriculture can resume normal operations with a man power untrained in the new technics of production and service.

Federal and State vocational staffs have during the past year realized this responsibility for rendering labor fit for employment, and assisted local communities to modify their vocational programs accordingly. Relief of unemployment has in fact been a dominant interest in vocational education during the year.

Services rendered under the cooperative efforts of Federal and State vocational staffs have included an extensive survey of changing conditions in industry, agriculture, and the home, to determine specific needs for training, and the modification of vocational programs required to meet these needs in keeping labor fit for employment; analysis of the vocational training needs of, and organization of training programs for, youths assembled in Civilian Conservation Corps camps; development of suitable courses in public schools for youths in the ages of 14 to 16 years who are not any longer permitted under State laws and National Recovery Administration codes to enter into or continue in regular employment, and who must therefore be either in school or completely unemployed; the development of vocational training adapted to the needs of farmers operating under the agricultural adjustment programs for the rehabilitation of agriculture and improvement of the employment situation in that broad field; development of subsistence homestead farming programs; survey of handicraft occupations, and of training needs for such occupations, as available

resources for unemployed workers under certain conditions; formulation of live-at-home programs for those with part-time employment; survey of training needs of individuals and families returning to farms from industrial centers where unemployment has prevailed, to adjust such individuals and families to employment conditions in the rural community; development of home-making programs adapted to the needs of individuals and families on relief, or with incomes reduced by unemployment, and generally of home-making programs for safeguarding the welfare of the family under conditions imposed by unemployment and diminished family incomes; conduct of surveys to determine the number and training needs of unemployed disabled persons, and of employment opportunities available for such persons; expansion of services being rendered for the vocational rehabilitation and return to remunerative employment of unemployed physically handicapped persons; and development of cooperative working relations between State employment offices and vocational rehabilitation departments, under section 7 of the Wagner-Peyser Act passed during the year to promote a national system of employment offices.

While many of these services have during the past year taken on the aspect of emergency services, and have involved extensive cooperation with emergency agencies organized specifically for dealing with the prevailing unemployment situation, they are not essentially new in character. On the contrary they are all of them implied as required to be rendered under our established national programs for cooperation with the States in the promotion of vocational education and rehabilitation.

3. COOPERATION WITH EMERGENCY AGENCIES

FEDERAL EMERGENCY RELIEF ADMINISTRATION

Shortly after the creation of the national relief program, offers of cooperation were made of all facilities of the Office of Education with reference to the fields of general education, vocational education, and rehabilitation in order to assist in developing a Nation-wide program of work relief for professional people qualified to teach in developing various educational projects. Preliminary conferences were held from time to time to discuss the matter and the Commissioner called a meeting of State superintendents to discuss possibilities.

Arising out of these preliminary contacts a representative of the Office of Education was officially designated as liaison officer representing general education and adult education, while another member of the Office was designated as liaison officer to represent vocational education and rehabilitation. These two staff members, together with the Commissioner, worked in formulating several authorizations creating work relief in various educational projects and then developed

outlines for State plans to take advantage of these authorizations. When, later, an educational division was set up, the two liaison officers were lent for full-time service.

It became evident that an authorization should be formulated to take care of children of preschool age from unemployed underprivileged families. The services of a specialist in nursery-school education were accordingly lent to the relief organization to organize this work and this developed into a full-time loan through the fall and winter for the administration of this special activity.

In order to stimulate the use of the relief program in providing a proper proportion of the emergency educational services to take care of the special needs of the colored race, a specialist in Negro education was loaned to the Relief Administration and he has spent part of his time ever since on this activity.

The critical condition in the rural schools of many of the States indicated that a special relief program would be needed. To determine which financially destitute rural school districts would be eligible to receive the benefits of the new authorization, the services of the statistical staff of the Office of Education were made available. Members of that staff and three experts supplied by the General Education Board were sent to the State departments of education to work with them and the State relief offices in devising individual State forms to secure the desired information and pass upon the claims of various rural school districts.

Committees representing various college associations conferred with the specialists in higher education of the Office and with Relief Administration officials to consider the problem of developing a program of part-time jobs for needy college students who would otherwise be unable to continue their work in school or enter college the second semester. Growing out of these conferences authorization was made providing for 100,000 such part-time jobs open to all colleges and universities organized on a nonprofit basis. A statement of the fundamental conditions providing for participation by the institutions was accordingly formulated with the aid of representatives from the Office of Education and this program went into active effect at once.

To assist in the development of certain specialized forms of education in ways which could not be financed by the State departments of education or the relief funds made available, the Commissioner took an active part in securing special grants from the General Education Board which greatly aided the development of the nursery school program, parent education, and workers' education in the various States. Both the Commissioner and the Assistant Commissioner have actively participated throughout the year in serving on national

advisory committees, notably in the field of nursery school and parent education to assist in the furtherance of these programs.

A meeting, open to representatives from the States engaged in the emergency educational program, was held in connection with the annual program of the American Association for Adult Education and separate programs in these States were participated in by a number of the members of the staff of the Office of Education.

As a result of the serious situation arising in certain sections of the country this summer in the drought areas, the Federal Relief Administration officially requested the Office of Education for assistance in making a study of the special educational needs in the drought areas and two staff members have been officially assigned up to the present time to assist in making this study.

NATIONAL RECOVERY ADMINISTRATION

Members of the staff of the Office of Education have devoted much time during the year to conferences with representatives of the National Recovery Administration, the Agricultural Adjustment Administration, and other recovery agencies.

These conferences have taken up certain aspects of the recovery measures which have an educational significance. The home economics education service of the Office, for example, has cooperated with the States in furthering the recovery program by distributing such literature as has been made available at National Recovery Administration and Agricultural Adjustment Administration headquarters, dealing with problems confronting homemakers in safeguarding the interests of consumers. The service planned a conference on consumer education to develop ways and means of increasing the effectiveness of such education in school programs at all educational levels. The service has cooperated with State staffs also through regional and other conferences, and by correspondence, in making materials on consumer education available to teachers, and in aiding teachers of home economics to initiate instruction along these lines in their teaching programs. Similar cooperation has been effected through the Agricultural Education Service of the Office with the Agricultural Adjustment Administration in adapting vocational agriculture programs to emergency conditions.

One development of cooperation with the National Recovery Administration deserves special mention. During the year industrial occupations have been very generally brought under "codes of fair competition." Under these codes many important questions have arisen regarding apprentice training, as well as training of adult workers. An analysis was made in the trade and industrial service of the Office of Education of all codes approved over a period of 6 months. The volume of this material may be inferred from the fact

that as published in printed or mimeographed form it occupies some 6 feet of shelf room. The objective in making this analysis was to determine what provisions had been incorporated in the codes for apprenticeship and other forms of training. As a result of the analysis and of conferences with representatives of the National Recovery Administration, a Federal committee on apprentice training has been established by the Secretary of Labor, under an Executive order of the President to advise the Secretary and perform such other functions as the Secretary may direct. This order defines an apprentice to mean "a person of at least 16 years of age who has entered into a written contract with an employer or an association of employers which provides for at least 2,000 hours of reasonably continuous employment for such person and his participation in an approved program of training as hereinabove provided." The committee as established under this order comprises 1 representative and 1 alternate from the Division of Vocational Education of the Office of Education, 1 from the Department of Labor, and 1 from the National Recovery Administration.

This formal recognition of the need for organized apprentice training is consistent with, and a long step forward in the direction of more effective realization of the policies of the National Vocational Education Act of 1917, which specifically provides for cooperation with the States in the promotion of such training.

The Office of Education cooperated with the National Recovery Administration in its study of the application of codes of fair competition to privately controlled colleges and universities. As a result of the study, the National Recovery Administration ruled that the Educational activities of privately controlled, non-profit-making colleges should be exempt from the operation of codes if their public service nature was attested by the exemption of their educational property from taxation under the provisions of their charters. Since the code for the textbook publishing industry was intimately related to school costs members of the staff advised with the Administration relative to fair practices in the production and distribution of textbooks.

THE CIVILIAN CONSERVATION CORPS EDUCATIONAL PROGRAM

The plan for an educational program in the Civilian Conservation Corps as approved by President Roosevelt December 7, 1933, was the joint product of Dr. George F. Zook, United States Commissioner of Education, Mr. Robert Fechner, Director of Emergency Conservation Work, and Gen. Douglas MacArthur, Chief of Staff, War Department.

In the conduct of this program the Office of Education acts in an advisory capacity to the War Department. It is charged with the selection and appointment of the educational staff, and it recom-

mends to the Secretary of War the outlines of instruction, teaching material, and types of teaching procedure for use in the camps.

The original plan provided for an Educational Director, working under the guidance of the Commissioner of Education, a corps area educational adviser at each of the nine Army corps area headquarters, a camp educational adviser in each of the 1,468 camps, and an enrollee in each camp chosen as an assistant leader to help the camp educational adviser.

Unfortunately, the budget of the educational program for the 12-month period, April 1, 1934, to March 31, 1935, when finally approved did not carry sufficient money to provide an educational adviser in each camp. Consequently a total of 1,087 educational advisers are now serving the 1,468 camps.

As of the date of this report, the Civilian Conservation Corps educational program stands at full strength in administrative and teaching staff about as follows:

Washington and corps area administrative staff.....	12
Camp educational advisers.....	1, 087
Assistant camp leaders.....	1, 468
Total full-time educational staff.....	2, 567
Additional part-time teaching staff (estimate).....	5, 000
Total administrative and teaching staff (estimate).....	7, 567

As an educational staff operating in one particular type of educational enterprise, this is one of the largest in the world.

For two reasons it is difficult to determine the actual number of enrollees who are participating in the camp educational programs: (1) The large migration of camps in the late spring greatly disturbed the schedules, and (2) the large turnover of enrollees both in April and July made statistics of class attendance practically useless.

In one way or another the presence of an educational staff in camp, and the operation of an educational program, together with the sanction and fostering of educational interests by the Army and Forestry and Parks staffs are not without benefit to every Civilian Conservation Corps enrollee.

The more formal educational interests of enrollees, i.e., interests which are expressed through enrollment in classes or groups for sustained study, fall into these several fields:

(1) *Vocational subjects*.—Enrollees because of their economic plight are mostly interested in better preparation for lines of work which they have followed or for new lines of work.

(2) *Fundamental subjects*.—Probably half of the enrollees have not gone beyond elementary school and a considerable proportion of that half did not complete elementary school; many had no schooling, and others who had a few years of schooling are functionally illiterate.

(3) *Academic subjects*.—This group includes those subjects common to the high school or college curriculum, such as English, history civics, etc.

(4) *Self-expression subjects*.—Dramatics, glee club, debate, spelling bees, hobby crafts, etc.

The handbook for Civilian Conservation Corps educational advisers, prepared by members of the staff of the Office of Education and issued by the Secretary of War, contains the following statement of aims of the Civilian Conservation Corps educational program:

(1) To develop in each man his powers of self-expression, self-entertainment, and self-culture.

(2) To develop pride and satisfaction in cooperative endeavor.

(3) To develop as far as practicable an understanding of the prevailing social and economic conditions, to the end that each man may cooperate intelligently in improving these conditions.

(4) To preserve and strengthen good habits of health and of mental development.

(5) By such vocational training as is feasible, but particularly by vocational counseling and adjustment activities, to assist each man better to meet his employment problems when he leaves camp.

(6) To develop an appreciation of nature and of country life.

Participation of enrollees in the educational program is voluntary, not mandatory. Classes and discussion groups meet in the evenings and at other times that do not conflict with the regular working hours on forestry projects and other work projects.

There is abundant evidence that intelligent and imaginative educational advisers are conducting educational programs under camp conditions with beneficial results to many thousands of enrollees.

PUBLIC WORKS ADMINISTRATION

The National Recovery Act specifies preferences which must obtain with respect to those given jobs on public works projects. One such preference relates to place of residence, the first preference being given to the residents of the county where the project is located. Strictly interpreted, this provision of the law would prevent college students from working on public works projects unless the students lived in the county where the projects are located. The so-called "cooperative colleges" which depend upon getting educationally significant jobs for their students as a part of the regular curriculum requirements, found this residence provision a very serious obstacle to their work. Only such students as lived in the county where the college was located could be placed on jobs in that county. When the matter was brought to the attention of the Public Works Administration by the Office of Education, a ruling of far-reaching importance was obtained. It was held, in effect, that for purposes of the National Recovery Act, a student is a resident

of the county where the institution is located which he is attending. Furthermore, that if the curriculum calls for work on a project in a county other than the one where the institution is located, that other county becomes the seat of the institution for the students assigned to that project. Hence, the students so assigned are residents of the county where the project is located. The residence preference difficulty was thus overcome in the case of students in cooperative colleges. This ruling made possible the continuation of cooperative colleges of engineering through this period, when about the only engineering activities are those connected with Public Works projects.

When funds were made available for school building and repair the Office furnished all State, city, and county superintendents, and all presidents of State colleges and universities full information on the subject and offered its services in expediting the consideration of applications for school-building projects. By February 1934, grants and loans had been made to schools in 116 cities and 17 counties in 41 States, and by the end of the fiscal year, a total of over \$100,000,000 had been allotted to schools and colleges.

FEDERAL EMERGENCY RELIEF ADMINISTRATION RESEARCH

The Office of Education approved and sponsored research projects in three universities, Columbia, New York University, and Chicago. The research workers were paid from emergency relief funds. A total of more than 1,700 workers were employed for periods ranging from a few weeks to more than 6 months. The experience with these projects revealed how effective universities are as agencies to give work relief to needy persons of highly specialized training.

II. OFFICE OF EDUCATION

1. RESEARCH AND INVESTIGATION

EDUCATION DURING THE DEPRESSION

There has been a large demand from various sources for information concerning the effects of the depression on the schools and much time has been spent by the Office in collecting data to meet these requests.

In a circular on City Schools and the Economic Situation we furnished information concerning comparative expenditures and budgets for 1933-34 and for recent years, the changes in enrollment and in teaching force, and changes in special services and special classes.

In the Economic Outlook in Higher Education we presented data on the reduction of teaching staff and changes in salary, the trend

of indebtedness of these institutions, and the present income and expenditures as compared with other years.

Material in these studies and other data available were combined and presented in popular form in *The Deepening Crisis in Education*.

SCHOOL ADMINISTRATION PROBLEMS

How to economize in school expenditures is a question that for the past few years has been confronting school administrators. In order to indicate how this problem may be solved in part, the Office of Education has prepared a series of publications on possible economies in school administration. In all, 11 numbers of the series have been issued, several of which were prepared in 1932-33 and reported for that year. Those not reported that year and completed this year are:

(1) *Economies Through the Elimination of Very Small Schools* Bull., 1934, no. 3. This study was prepared (a) to present data showing how prevalent and wide-spread the small-school problem really is; (b) to examine concrete evidence of the cost of extremely small schools; (c) to cite ways and means employed both in this country and abroad in reaching a solution to the problem.

(2) *Economies in Class and School Organization* (Cir. No. 113). This study presents procedures which have to do with the organization of classes and schools and with the distribution of pupils in the elementary school grades.

(3) *Techniques for Teaching Large Classes* (Cir. No. 114) which summarizes some of the studies on class size and the methods employed in a number of school systems in teaching large classes.

(4) *High School Instruction by Mail* (Bull., 1933, No. 13). This study shows that by means of correspondence courses inordinately small secondary school classes may be eliminated, that the offerings in small high schools may be increased, and that such courses provide a means of education for children unable to attend school because of distance or some physical handicap, and also for adults.

(5) *Operation and Maintenance of the School Plant* (Cir. No. 115) which shows how savings and economies have been effected in many school districts by looking after details in the matter of operating and maintaining the school plant.

(6) *Economies Through Budgeting and Accounting* (Cir. No. 116) which cites examples and uses relevant excerpts on procedures in budgeting and accounting.

(7) *A Selected and Annotated Bibliography on Economies* (Cir. No. 118) which aims to furnish to school officials a selected list of materials dealing with the administration of schools during the depression.

The financial aspects of the consolidation of schools and of the transportation of pupils is a problem in which much interest was manifest. As a result of a conference on the subject called by the Office of Education, Circular No. 117, Financial Implications of the Consolidation of Schools and the Transportation of Pupils, was prepared. This report includes data showing what economies may be effected by consolidating schools and school districts.

A study was made to show to what extent school support in the cities of the country has decreased and what some of the effects of such decrease has been (Cir. No. 124). Another study was made which summarizes the condition of the public schools in the States in 1932-33 and the prospects for 1933-34 (Cir. No. 119).

Studies in progress nearing completion are Compulsory School Attendance Laws and their Administration and State Provisions for Equalizing Educational Costs.

EDUCATIONAL LEGISLATION

The paramount educational legislation problem during the year consisted in replenishing insufficient school funds. Facing grim realities, there was a general realization on the part of legislators that many traditional local school systems had outlived their usefulness; and in a few States legislators disclosed a willingness to follow the theory that education is a State function to its logical conclusion. Since the founding of statehood both legal and educational theories have regarded education as a State function, but the proposition that the State should assume a sizable or major amount of the financial responsibilities for the support of public education has been a slow legislative development. The economic depression has given profound impetus to this movement.

By reason of the deep concern over the financial difficulties of education correspondence concerning school legislation was greatly increased and the services rendered considerably extended. During the fiscal year the Office continued its policy of issuing circulars on current legislative action affecting education and three such circulars were issued, each entitled "Legislative Action in 1933 Affecting Education", one of which summarized legislation affecting the financial support of schools. One circular has also been issued on legislative action in 1934 affecting education and another circular is now in progress. Reviews of significant phases of current educational legislation were also prepared for publication in October, December, and June issues of *School Life*. Other studies completed in the field of school law include an analysis of the principal provisions of State-wide systems for the retirement of public-school teachers (Bull., 1934, No. 6), and *The Legal Status of Married Women Teachers* (Pamphlet No. 47).

School legislation studies now in progress include a biennial review of outstanding educational legislation for 1933 and 1934, and a school legislation handbook consisting of summaries of legislative tendencies and present legal status of major phases of education.

ELEMENTARY EDUCATION

Much of the work in the field of nursery-kindergarten-primary education during the past year has been directed to further emergency programs and to meet the widespread interest aroused in the education and welfare of very young children.

Information regarding the State and city support of educational programs for children 4 and 5 years of age was summarized for distribution. This summary indicates that local interest and information concerning the values of educating children prior to 6 years of age are as potent factors in securing educational programs for children of this age as is legislation. However, in support of legislation, the summary shows that more cities maintain kindergartens when State laws require that parents' petitions for such schools must be granted and where the laws designate that their support shall be cared for from the general school fund rather than from an easily eliminated local or special tax.

Summaries of studies were made which show the relative progress through the upper elementary grades of children starting school with and without kindergarten experience. Material to aid parents in carrying on educational activities in the home has been put in permanent form. Bibliographies have been prepared on nursery education, on the teaching of reading and arithmetic, on pupil rating and pupil progress and on sources of help for classroom teaching problems.

SECONDARY EDUCATION

During the year the publication of the monographs of the National Survey of Secondary Education was completed; the entire report of the survey is now available. In cooperation with the national committee on research in secondary education we have made a study of needed research in secondary education, the publication of which will serve as a sequel to the survey. An analysis of numbers of schools, teachers, and pupils at the high-school level in cities of over 10,000 population was made. The study dealt with different types of high schools and showed trends over the period 1918-32.

STATISTICS OF EDUCATION

The function of the Office as a clearing house for data on all forms of education on a national scale has made the collection, tabulation, and dissemination of statistical information one of its major duties.

The use of a small field staff not only enables the Office to obtain approximately 100 percent of the reports, but provides experts in school records and accounts who can help local educational authorities with their recording and reporting problems and aid in establishing more uniform record systems in all parts of the country.

The emergency in education created a major statistical problem during the year. The demand by Congress and the public for information on the condition of schools necessitated special studies for city schools, all public schools, and for institutions of college grade. Our file of statistical reports was used especially by the Public Works Administration, Reconstruction Finance Corporation, Federal Emergency Relief Administration, and Tennessee Valley Authority in checking data on school systems and institutions. The statistical field force spent considerable time assisting the Federal Emergency Relief Administration.

Special notice should be taken of the fact that the statistics of State school systems, 1931-32, published this year, include a fuller analysis of data and graphical presentation than usual, and for the first time a number of tables giving State figures for rural and urban schools in comparable form.

In the interest of more uniform reporting the State Department of Education of Iowa was assisted in setting up a new system of records and reports.

TABLE 1.—*Review of statistical work 1933-34*

Subject of study	Type of study ¹		
	Biennial	Periodic	Special
Statistical summary of education.....	T	-----	-----
State school systems:			
Personnel and finances.....	T	-----	-----
Consolidation and transportation of pupils.....	-----	-----	T
Effect of economic situation.....	-----	-----	C-T
City school systems:			
Personnel and finances.....	C	-----	-----
Per capita costs.....	-----	C-T	-----
Effect of economic situation.....	-----	-----	C-T
Grade enrollment.....	-----	-----	T
Expenditures of operation of plant.....	-----	-----	T
Expenditures for fixed charges.....	-----	-----	T
School buildings.....	-----	-----	T
Higher education:			
Personnel and finances.....	T	-----	-----
Land-grant colleges.....	-----	C-T	-----
Effect of economic situation.....	-----	-----	C-T
Cost of going to college.....	-----	-----	C-T
Student aid.....	-----	-----	C-T
Residence and migration of college students.....	-----	-----	T
Financial problems of colleges.....	-----	-----	C-T
Secondary schools:			
Public:			
Personnel.....	-----	C	-----
Subject enrollment.....	-----	C	-----
Private:			
Personnel.....	-----	C-T	-----
Subject enrollment.....	-----	C	-----
Accredited.....	-----	C-T	-----

¹ C is collected; T is tabulated.

TABLE 1.—*Review of statistical work, 1933-34—Continued*

Subject of study	Type of study		
	Biennial	Periodic	Special
Elementary schools:			
Public:			
Administration, city, county.....			C-T
Private:			
Personnel.....		C-T	
Commercial schools, private:			
Personnel.....		C-T	
Teaching staff, physical care of teachers.....			T
Negro education.....		T	
Personnel and finances.....			
Availability of rural education.....			C-T
Guidance, case studies.....			T

COLLEGIATE AND PROFESSIONAL EDUCATION

The financial distress of colleges and universities has been a problem of major importance this year. Minor investigations required to satisfy requests for information occupied considerable attention of staff members. Two studies of wider scope were made: (1) The economic outlook in higher education, and (2) financial status of the smaller colleges.

Teacher unemployment and the danger of lowering of standards of teacher education led to the conduct of a study on the certification of teachers which is now in progress. This study follows the virtual completion of the 3-year program of research by the National Survey of the Education of Teachers, authorized by Congress and conducted under the auspices of the United States Office of Education.

A study of graduate work in American colleges and universities has been completed. This study shows the development of graduate work since 1642 and the evolution of standards and practices for the awarding of the master's and doctor's degrees.

A cooperative study sponsored by the National Committee on Music in Education concerning the preparation of music teachers, was begun in 1933. The returns have been received and a report is being formulated.

An investigation was made of the cost of going to college in 1,600 institutions of higher learning throughout the United States.

The educational directory was changed in organization, bringing together in one place all the facts about each institution and also bringing together all the institutions in each State.

A study of the supervision exercised by States over privately controlled institutions of higher education was completed during the year. This study showed for each State the legal requirements with which such colleges and universities must comply in obtaining their charters of incorporation, and the laws providing for their supervision after the charters are granted. A special phase of the study gives in-

formation regarding the States which have adopted restrictions upon privately controlled institutions in the conferring of academic degrees.

A study of the extent and historical development of privately controlled higher education in the United States laid special stress upon the relation of the colonial and State governments to privately controlled colleges and universities.

TEACHER PREPARATION AND PERSONNEL

Research was conducted by the Office of Education during the past year in the field of teacher preparation and personnel through the National Survey of the Education of Teachers, a 3-year investigation authorized by Congress at a cost of \$180,000. The survey is practically completed, and the printed report will be available in 6 volumes. One, a bibliography on the education of teachers, was distributed last year. A second, which discusses the education of Negro teachers, was distributed during 1934. Three of the remaining four volumes, on teacher personnel, teacher education curricula, and special survey problems, have been sent to the printer. The last, a summary volume, will be completed during 1934. The results of this investigation, which is the most extensive ever conducted, are in considerable demand throughout the country by investigators and workers in teacher preparation. One example of this demand is afforded by the National Society of College Teachers, which plans to devote its current yearbook to a discussion of survey findings. Both institutional and State authorities, as well as strictly professional groups, should find the results of the survey of assistance in the development of their local and State programs of teacher preparation.

EDUCATION OF NATIVE AND MINORITY GROUPS

The Office of Education has continued its services—research, informational, and advisory—in the education of native and minority groups in continental United States and its outlying parts, involving the educational welfare of approximately 15 million people widely scattered throughout the world.

Two bulletins completed during the year are now in page proof; one a description of educational conditions and progress in Puerto Rico, and one similar in type concerned with the Virgin Islands. These are the result of personal investigations in the respective insular groups. Two extensive reports were finished; one on Education among Native and Minority Groups in Alaska, Puerto Rico, Virgin Islands, and Hawaii for the January 1934, issue of the *Journal of Negro Education*; the other, a comprehensive description of education in rural communities of the United States prepared for the Inter-American Education Federation conference to be held in Santiago, Chile, in September 1934.

The division has continued its services on educational problems concerned with the teaching of English to children from foreign language speaking homes. Bilingualism offers difficult problems in teaching, both in continental United States and outlying parts such as Puerto Rico, the Philippine Islands, and Hawaii. Bibliographies on different phases of the problems involved have been prepared and one covering the subject as a whole completed during the year is now being printed as No. 23 of the Good Reference Series.

EDUCATION OF EXCEPTIONAL CHILDREN

This service of the Office of Education continues to stand for adequate educational adjustment for all children who deviate seriously from normal in physical, mental, or emotional status. The program of the past year has included consideration of classroom problems, research projects, and bibliographical work.

To help the teacher of exceptional children in the classroom, the series of pamphlets begun during the previous year on "Teachers' Problems with Exceptional Children" has been developed. Of the 8 pamphlets projected, each dealing with a particular type of child, 6 have either been released or are in press. In addition to these, specific suggestions for classroom activities for retarded children have appeared both in a printed bulletin and in three supplementary typed loan books available for circulation. A similar book containing activities for gifted children has been prepared and is in use. Also a set of lantern slides depicting these activities is in circulation. All these materials have proved to be much in demand.

Foremost among the research projects undertaken has been a survey of employment possibilities of the deaf and hard-of-hearing financed by the Federal Civil Works Administration. This study was launched primarily as a guidance project, with the objective of ascertaining for which occupations deaf and hard-of-hearing children can most successfully be trained. Extensive field work, involving the services of over 300 persons in 27 States and the District of Columbia, has been completed and tabulations are in progress. A second research project of lesser scope has been continued from the previous year in cooperation with a city-school system, and is designed to throw some light upon the value of special classes for retarded children.

A series of circulars was issued as supplementary to a bibliography on the education of exceptional children printed several years ago.

EDUCATION OF NEGROES

Four major studies on the education of Negroes have been issued by the Office during the past year, namely: (1) Survey of secondary education for Negroes; (2) survey of the education of Negro teachers;

(3) a study of rural education among Negroes under Jeanes supervising teachers; and (4) a background study of Negro college students.

Another study which is nearly completed investigates the availability and accessibility of schools and the quality of education furnished Negro children in rural communities. All the data for this study have been collected and tabulated, and the report is now being written.

Through the cooperation of the Federal Emergency Relief Administration a follow-up investigation of the background study of Negro college students was begun. The immediate aim of this study is to ascertain the relation of certain background factors to subsequent success in college. The ultimate purpose, however, is to establish trends and to evaluate procedures in the field of student personnel.

The preparation of the proceedings of the National Conference on fundamental problems in the education of Negroes is now under way and is expected to be issued by the Office in the fall. This will consist of a digest of the committee reports made to the conference, together with some of the more important addresses. It will also contain suggestions helpful to schools, teachers, administrators, and organizations in appropriating some of the important values of the conference and in adapting them to their local and special needs.

SCHOOL HYGIENE, PHYSICAL EDUCATION, AND RECREATION

The teacher can only do her best work when she is in her best condition, physically and mentally. While her fitness depends largely on her own conduct her employers have a considerable responsibility for her welfare. We have completed an investigation into what school authorities, in cities of 5,000 population and over, are doing to preserve and promote the health of teachers in the way of medical service, and the granting of sick leave and absence for study or recreation.

While instruction in the effects of alcohol and other narcotics has long been required by law, the repeal of the eighteenth amendment renews the importance of such instruction. As an aid to those who are preparing courses of study in this field we have prepared a brief review of earlier pedagogical methods and of present trends in such education, together with selected references on the subject.

All phases of school health work center in the elementary grade teacher, but for her work in this field she needs adequate preparation. A few teacher-training institutions are giving the needed instruction, and we have asked these schools for an account of their methods which we hope to publish.

Studies of the physique and carriage of school children were made during the year, and the project in this field is about completed.

GUIDANCE AND INDUSTRIAL EDUCATION

As a result of the growing recognition of the importance of guidance in the program of education, attention is being directed not only to provisions for new and specific agencies, such as counseling, for the realization of guidance objectives, but also to an analysis of various kinds of school activities that may be made to contribute to the guidance function. In line with this tendency this Office made studies of two kinds of school activities that have guidance values. One of these was a study of opportunities provided in high schools for instruction in occupational information. It has been known that, for a score or more of years, some high schools of this country have been giving instruction in this subject, but to what extent such courses were being given was a matter of speculation. The study conducted by this Office included special reports from 1,111 representative public high schools, of various kinds and sizes, that cooperated in providing for publication, information on instruction given in occupational information. The other study dealt with school clubs and had as its aims the determination, by means of representative sampling, of the extent of the development of clubs in public high schools, the kinds of school clubs, their organization, and the kinds of work carried on in this extra-curriculum type of school activity. Junior and senior high schools to the number of 883 cooperated with this Office in supplying information for the study which was compiled for publication.

An increasing interest in technical and industrial education is manifest in all industrial countries. This Office assisted the International Bureau of Technical Education, in the study of this phase of education in many countries, by furnishing information on the situation in the United States. The material gathered by the International Bureau was published and became the basis for discussion at the Conference on Technical Education held at Barcelona, Spain.

EDUCATIONAL MEASUREMENT

Service in this field was continued with the objective of encouraging more accurate methods of evaluation and direction of education. One study in line with this objective has been that of the use of tests and measurements for the determination of admission and guidance of entering college freshmen. The resulting bulletin (in press) describes the techniques necessary for setting up the more accurate methods for predicting college success and gives the results of investigations.

A study of the techniques and tests which may be used to distinguish between the strengths of the abilities of pupils has been published under the title "Differential Diagnosis of Ability in School Children."

An analysis of the possible use of tests for purposes of determining high-school accreditation has been made. It was found that the test results ordinarily found in high schools are not sufficient for the purpose. The methods which may give accurate results have been discussed. This study is being issued in the (mimeographed) circular series.

A study, under way in the elementary field, is concerned with the methods used by schools in promoting pupils. This study will attempt to bring together some unity in the thinking in this field and will show the actual practices of the schools.

ADULT AND PARENT EDUCATION

Adult education activities of the specialist in this field have been conducted principally in connection with the Federal Emergency Relief Administration.

A study was completed during the year of the activities and projects of many agencies and institutions now at work in parent education. In addition to colleges and universities this includes the work of State teachers colleges, State departments of education, public schools, and organizations of various kinds.

Suitable literature has been pointed out to parents in various ways, through the preparation and distribution of bibliographies, reading courses, and during the past year particularly, by the preparation and distribution of a series of reading guides called "Searchlights."

Parent-teacher associations have become increasingly important to public and private schools. Such associations in elementary schools are becoming generally more successful but difficulties have been met in adjusting programs and projects to the needs of parents of high-school boys and girls. In response to an invitation from the national congress of parents and teachers the Office has instituted a study of successful organizations and programs of associations for high schools.

COMPARATIVE EDUCATION

The associate specialist in foreign education spent 2 months in Czechoslovakia studying its educational system. Studies were made of institutions of higher education in Denmark; education in India; national aid for school-building construction in England, France, and Belgium; courses in organic chemistry in secondary schools in Germany; and schools of fishing in foreign countries. A comprehensive list of references on foreign and comparative education was prepared.

Mainly by correspondence, but occasionally by personal contact, the division aided and directed 153 studies in comparative education ranging in scope from term papers to theses for the doctorate.

Among these were the collection of data from 12 European countries on the training of handicapped children for the New York City school authorities, teacher-training in Switzerland, and nurse-training in other countries. A record of current foreign education publications was prepared for the use of students and published in the Elementary School Journal.

VISUAL EDUCATION AND EDUCATION BY RADIO

Much of the time of the specialist in this field was occupied with the preparation for and attendance at the International Congress of Educational Cinematography which was held in Rome. Two conferences on education by radio, called by this Office, are mentioned in more detail elsewhere in this report.

SCHOOL LIBRARIES

The rural-school library study which has been carried on under a grant-in-aid from the Carnegie Corporation was completed this year and was published by the American Library Association under the title "A Study of Rural School Library Practices and Services." The subject matter consists largely of first-hand information which was secured by the specialist in school libraries in visits to 42 States.

In addition to this piece of work a study of Aids in Book Selection for Secondary School Libraries has been completed.

STATUS OF NATIONAL SURVEYS

All of the 28 monographs reporting findings of the national survey of secondary education came from the press and are now available from the Superintendent of Documents. During the fiscal year of 1933 the Superintendent of Documents sold 13,868 copies of these monographs.

The manuscript of the National Survey of the Education of Teachers is completed. The sections entitled "Selected Bibliography", and "Education of Negro Teachers" were published during the year and the remainder of the report will be available in the near future.

The third national survey, that on school finance, was completed and published before the beginning of the fiscal year.

HISTORY OF EDUCATION

In line with a policy of long standing the Office has this year published two volumes on the history of education: The History of Education in the State of Washington, by Dr. Frederick E. Bolton, and The Federal Cooperation in Agricultural Extension Work and Vocational Education and Vocational Rehabilitation, by Dr. L. E. Blauch.

2. STIMULATION AND COORDINATION OF RESEARCH

COLLECTION OF UNPUBLISHED RECENT RESEARCH

For the past few years we have been developing a record of contemporary research conducted in various educational institutions and have collected as far as possible and made available for general use, the studies completed by those seeking advanced degrees in colleges and universities.

Our 1932-33 bibliography of research in education lists 4,061 masters' and doctors' theses and faculty studies in the various fields of education completed between September 1, 1932, and August 31, 1933, reported by 128 colleges and universities.

We have, available for interlibrary loan, 1,394 masters' and doctors' theses on all phases of education, placed in our library by 54 colleges and universities. Several institutions have made us a depository library for receiving and loaning copies of all of their theses in education. The thesis collection is in constant use in the library and a total of 446 theses has been loaned to colleges throughout the country.

We have author and subject catalogs of this collection. In response to letters from graduate students and faculty members of institutions of higher education, we compile lists of theses available for loan, and lists of those reported to us as having been completed since the last printed bibliography, to assist them in determining what studies have been made in the various fields in which they are working.

Annually we issue mimeographed lists of research and investigations carried on by State departments of education and State education associations, and by city school systems, containing studies completed during the previous school year which are on file in the library, those in progress and those contemplated.

COOPERATIVE STUDIES

The Office is working with other organizations on certain projects in which mutual assistance seems desirable. With the National Association for Nursery Education we are making a bibliography on nursery education; with the National Committee on Research in Secondary Education we are preparing a list of suggested research studies; with the National Committee on Music Education we are investigating the status of music in education; with the Society for the Promotion of Engineering Education we are conducting a survey of graduate work in this field; with the National Congress of Parents and Teachers we are studying the problem of improving programs of parent-teacher associations in high schools and with

the school systems of Minneapolis, we are investigating the values of special classes for retarded children.

3. SURVEYS CONDUCTED BY THE OFFICE

The following surveys of educational work were completed during the year or are in progress:

Rockland County.—At the request of citizens interested in the improvement of the educational program of Rockland County, New York, a survey of that county was undertaken by this Office. The present school plant and services, the social composition of the component communities, the major population movements of the county and other pertinent conditions are being examined to determine: (a) The various types of education which would constitute an optimum program of education suitable to the needs of all groups comprising the county, and (b) the best present utilization and future development of school buildings and equipment in relationship to a modern comprehensive program of education.

Appalachian region.—A statistical and graphical survey of the southern Appalachian mountain region recently made by this Office is now being published by the United States Department of Agriculture. In the making of this survey it became apparent that social and economic conditions in many of the southern highland counties were so undeveloped as to constitute a peculiar educational problem which should be examined more analytically. A study was, therefore, undertaken to make these peculiar problems stand out and to show how these problems are being attacked. This study is now nearing completion.

Public school needs for Federal aid.—The statisticians of this Office, with the assistance of the directors of education research in Arkansas, West Virginia, and Texas, were requested by the Federal Emergency Relief Administration to aid the States in ascertaining how much Federal aid was needed in order to keep the schools open the normal term in places of 5,000 population and less.

When the applications had been received the Office statisticians were asked to check the returns in cooperation with the State educational and relief officials to determine the final amount to be allotted to each State.

Oklahoma City.—The Office has assumed the direction of the curriculum study of the colored high school of Oklahoma City. This work will extend over a period of a year or more, and will include a limited social and economic survey of the community; a study of the drop-outs and graduates of the high school during the past 10 years; and a personnel study of the present student body. Also, some attention will be given to the relation of the elementary schools

to the high school. It is to be a cooperative enterprise involving the teachers as well as the patrons.

Cincinnati.—In June we accepted the invitation of the Cincinnati Bureau of Governmental Research to make a comprehensive survey of the public schools of that city. The invitation followed the formal resolution and request of the Cincinnati Board of Education to the Bureau to have such a study made. This survey presents a somewhat unusual problem in that the survey of Cincinnati's schools is in reality a part of a larger study of all child-welfare services of the community including recreation, health, and care of juvenile wards, each phase of the study being made by a separate group, but with the assistance of the Bureau of Governmental Research.

4. CONFERENCES

Conferences called by the Commissioner in regard to the financial situation in schools and colleges and with reference to the problem of unemployed youth are mentioned in the first section of this report. In addition, meetings were arranged by this Office for the discussion of the following subjects:

Educational measurements.—Persons engaged in the administration of and experimentation with tests and measurements in secondary schools were called together for a conference on equivalent and comparable scores on the secondary school level. There was a discussion of (a) the desirability of having equivalent and comparable scores and (b) how such scores might be established. It was the consensus of opinion that there was a need for such scores in order to facilitate the use of cumulative records for guidance purposes. It was recommended that further study of the problem be made and the United States Office of Education take the initiative in the project.

Education of Negroes.—The National Conference on Fundamental Problems in the Education of Negroes had for its object a consideration of the special and peculiar problems involved in the education of Negroes which arise from their economic and social status, and to focus the attention of the Nation on the educational disadvantages experienced by them. The work of the conference was performed by 14 committees over a period of several months. More than 1,000 persons registered for the meeting, 500 of whom were from 28 different States.

Motion pictures in education.—On the invitation of the Commissioner, 35 representatives of various governmental, educational, and motion-picture agencies met to prepare a composite report on the use of motion pictures in education. This report was issued as a mimeographed circular of the Office.

Motion-picture appreciation.—In cooperation with the Payne fund, a National Conference on the Teaching of Motion-Picture Appreciation

was held. About 30 representatives of the Government and national voluntary agencies participated in planning an experiment in teaching motion-picture appreciation. This experiment is being carried out in the high schools of Connecticut, Ohio, North Carolina, Iowa, and California.

Overworked textbooks.—Reduction in expenditures has, in many schools, extended to the purchase of textbooks with the result that these are used by more pupils in the same session and for a longer period of years. As a result the books become not only unsightly but insanitary. A conference on this subject called by the Office resulted in the publication of a circular, *Overworked Textbooks*, which warns of the menace from this method of economy.

Financial aspects of the consolidation of schools.—This conference was called at the request of a number of directors of finance in State departments of education to consider the results from the financial point of view of consolidation of schools and the combination of districts. Reports presenting data from county and State-wide studies in six States showed material economies effected by such procedures.

Two conferences were held to consider means of aiding the Office in its work with the Federal Emergency Relief Administration's program for the development of nursery schools. Representatives of three professional organizations attended the meetings.

5. OTHER EDUCATIONAL SERVICE

COOPERATION WITH PROFESSIONAL AND PUBLIC-SERVICE GROUPS

There is an increasing demand on the Office for cooperation with educational agencies making studies and conducting conferences on current problems in education. The amount of service that can be rendered by the present staff is, however, limited. We mention here some of the agencies with which the Office worked during the past year:

For the Bureau of Internationale d'Education, Geneva, Switzerland, we prepared a report on education in the United States for the year ended June 30, 1933. We helped the yearbook commission of the department of superintendence of the National Education Association in the preparation of its yearbook. We assisted the Bureau Internationale de L'Enseignement Techniques, Paris, France, in the selection of topics for discussion at the meeting called by the Bureau and prepared information on technical education in the United States which was published in the report issued by the Bureau. A staff member served as chairman of the National Education Association committee on social-economic goals of America, which prepared a report on 10 major goals in these phases of educational objectives. One of the staff served as a member of the National Association of High School Principals' Commission on the Reorganization of Secondary Education.

Manuscripts submitted by contestants in the prize essay contest of the Gorgas Memorial Institute were graded. The State Department of Education of Iowa was assisted in the organization of a new system of records and accounts. The national committee on research in secondary education was aided in its work. We assisted the committee on standards in industrial arts of the American Vocational Association in the preparation of a report on standards of achievement in the junior high school. The committee on State guidance programs of the National Vocational Guidance Association was aided in the preparation of a report on guidance activities sponsored by State departments of education. The American Library Association was assisted in a study on library planning. A section on school health work was prepared for the yearbook of social work of the Russell Sage Foundation. A member of the staff participated in the institute for the training of field workers conducted by the National Tuberculosis Association. We assisted the State Parent-Teacher Associations of Maryland and South Carolina in the organization of their programs of study, and a number of colleges were advised relative to the use of certain specific tests for predicting direct and differential college success.

CONSULTATIVE AND ADVISORY SERVICE

Besides service rendered through cooperative undertakings, by surveys, through participation in general conferences, through publications of the Office, by contributions to educational journals, and through public addresses, much of the time of the staff is given to the assistance of school administrators, teachers, students, parents, and others in their individual problems. Many persons seek information and advice by personal interview and there is a host of requests by correspondence for specific data and for direction in studies in every field of educational interest.

ARTICLES AND ADDRESSES

Although the staff of this Office was much reduced, more than 75 articles were written for publication in periodicals and yearbooks, and during the year over 200 addresses were made before National, State, regional, and local groups. Thirteen radio talks were prepared and broadcast.

EVALUATION OF FOREIGN CREDENTIALS AND ASSISTANCE TO STUDENTS ABROAD

The division which deals with comparative education problems handled, at the request of college and university registrars and committees of admission, 504 cases of evaluation of foreign student credentials with 1,197 separate documents in 21 different languages. With respect to country of origin the cases came from 70 political

divisions, the largest number being from the Germanic language countries. In addition, 77 cases were reviewed for one or another reason.

Many visitors from other countries, including India, China, Western Australia, Union of South Africa, France, and England, who came to the Division were aided and we advised other foreign visitors by letter. We made arrangements for an official delegation to attend the Third International Conference on Public Education held at Geneva, Switzerland, in July of 1934; wrote letters of introduction for and gave advice to Americans going abroad to study education; advised with and aided the Institute of International Education to prepare a guidebook for foreign students in the United States, and selected a list of American educational publications for the Institute of Intellectual Cooperation in Paris.

LIBRARY SERVICE

The library has continued its work of building up as complete collections of official publications as possible to furnish original source material; these include annual reports from State and city school departments, proceedings of State and National educational associations, complete files of educational journals, files of catalogs of higher educational institutions, textbooks used in the schools as far back as possible and to date, and books and monographs.

A collection of old educational periodicals and textbooks from 1850 to date, was cataloged during the year; a section of very old and rare American textbooks dating back to 1780 was listed with descriptions; an already large collection of courses of study both State and city in the various subject fields was augmented during the year, and a revision of the published list of such courses is well under way.

PUBLICATION SERVICE

The editorial and duplicating sections of the Vocational Education Division were consolidated with the regular Office Editorial Division during the year. As a result of this merger, the Editorial Division now handles such duties for the entire Office.

The work of putting informational material into print and the distribution of publications is furnished in the following statistics:

I. PREPARATION

Manuscripts read and edited for:	Number	Number of pages
1. Printing.....	68	16,752
2. Mimeographing and multigraphing.....	57	1,900
3. School Life (10 issues).....	275	1,650
Galleys of proof read.....	---	1,796

¹In addition, 4,417 bibliographical entries were read and edited.

I. PREPARATION—continued

	Number	Number of pages
Pages of proof read.....		4, 249
News releases for newspapers and magazines.....	55	220
Radio transcripts for broadcasting.....	13	130

II. DISSEMINATION

	Free, 1934	Sales, 1933
Bulletins, pamphlets, leaflets.....	243, 400	113, 268
Circulars (mimeographed).....	150, 630	-----
School Life (10 issues).....	19, 100	117, 624
		1934
Reprints from School Life, extra editions, index.....	22, 500	-----
Circular letters and miscellaneous mimeograph, multigraph and rotoprint information..... pages..	1, 008, 268	-----
Good reference series (mimeographed).....	5, 530	-----
Reading courses, etc.....	11, 300	-----
Price lists (mimeographed and printed).....	82, 000	-----
General information notices and advertisements.....	434, 906	-----

Sales of vocational education and rehabilitation bulletins, in addition, totaled \$2,674.32 during the year.

The Office issued 125 publications during the year, 68 printed and 57 mimeographed, multigraphed, or rotoprinted. Improvement in appearance of Office bulletins through use of additional illustrations, more artistic typography, and better quality paper, continued to result in general commendation and increased sales.

School Life.—This official monthly journal of the Federal Office of Education continued to enjoy the largest sale of any Government subscription publication. Sales of *School Life* in 1934 jumped to 117,624 copies from the 1933 sales of 82,638. During 1934 *School Life* reported the latest facts and statistics on the emergency in education, with special emphasis on the national recovery program and its educational implications.

Through an authorization by the Bureau of the Budget, *School Life* was increased in size from 20 to 24 pages during the year so as to report vocational education information gathered by vocational education specialists now on the regular office research staff.

News releases.—Fifty-five news releases announcing new Office publications and important educational information were prepared and mailed during the year to educational journals and newspapers in general.

Directories.—One of the major tasks of the Editorial Division during the year was the compiling of the 1934 Educational Directory, widely used by educators, citizens, and business people. The Directory was issued in four parts: Part I, Principal State and County School Officers and Other Education Directories; Part II, Principal City School Officers and Catholic Parochial School Superintendents;

Part III, Colleges and Universities, Including all Institutions; and Part IV, Educational Associations, Boards, and Foundations.

Radio service.—Through the courtesy of the National Broadcasting Co., the Federal Office of Education is now on the air to furnish important educational information once a week over a national network of radio stations. Nine such weekly broadcasts were made since this new method of disseminating Office of Education reports and current educational news was inaugurated.

Exhibits.—The Office supplied exhibits of its publications and services at approximately 25 educational meetings and conventions including the summer and spring conventions of the National Education Association. A special exhibit was prepared for display at the Century of Progress Exposition.

6. ADMINISTRATION

APPROPRIATIONS

Because of the reduction in appropriations it was again necessary during the year to eliminate a number of persons from the staff. The total number eliminated since April 15, 1933, is 17. In this number were included specialists in fields which must again be represented on the staff as soon as circumstances permit.

For the fiscal year 1934, Congress appropriated the sum of \$250,000 for salaries in the Office of Education, not including those for vocational education and rehabilitation. Of this amount only \$215,725 was made available for expenditure during the year. The amount available for 1935 is \$228,801. The increased amount available for 1935 is not due to any expansion in the staff, but is due entirely to the partial restoration of salary reductions.

HOWARD UNIVERSITY

Howard University was inspected during the year 1933-34, by the Office of Education, according to law. Among the developments of the year the following are of particular interest:

The school of education and the courses in art and home economics were merged in the college of liberal arts. The graduate school and the school of engineering and architecture were established and will begin functioning in the fall of 1934.

In order to offset losses in enrollments the trustees provided special scholarship funds and opportunities were offered needy students to participate in the aid provided for by the Civil Works Administration.

The law school was elected to full membership in the American Association of Law Schools.

There has been some reduction in the number of the teaching staff, and drastic reductions have been made in income and expenditures.

Great improvements in the physical plant are now under way.

There has been a great increase in all artistic activities of the university. The purchase of a new organ has been authorized for the school of music.

Student body.—The grand total enrollment of the university for 1933-34 was 1,626, of whom 939 were men and 687 were women. For the year preceding the enrollment was 1,893, of whom 1,094 were men and 799 were women. This indicates a net loss of 267 students or approximately 14 percent of the enrollment as compared with the net loss of 571 or approximately 23 percent for the preceding year.

One hundred and three students out of this net loss of 267 are to be accounted for by the discontinuance of the correspondence and theological college courses in the school of religion. Of the remaining 164 a loss of 151 is indicated in the undergraduate colleges, principally in the college of education where there was a loss of 144. This loss is almost wholly traceable to the discontinuance of the summer school which registered 291 students last year, 170 of whom were students in the college of education.

Medicine, dentistry, pharmacy, and law registered a net loss of only 11 students.

Teaching staff.—The teaching staff of the university in 1933-34 included a grand total of 237 members, of whom 135 were full-time and 102 were part-time. These are the equivalent of a full-time staff of approximately 154 teachers. This shows a decrease of 18 full-time teachers and 20 part-time teachers from the number of teachers employed in 1932-33. These reductions have been found necessary by reason of the decrease in enrollment and by curtailment of the income of the university.

Financial statement.—In 1933-34 the total income of the university was \$1,180,958.34,¹ of which \$715,282.76² was from the Federal Government and \$465,675.58 from private and institutional sources. In 1932-33 the income from the Federal Government was \$661,422.27 and from private and institutional sources \$429,422.52, a total of \$1,090,844.79. However, 1933-34 includes extension fund income and gifts of \$122,051.50 as compared with \$51,815.61 for the preceding year and receipts from the Federal Government for reconditioning and repairs of \$77,801.85, without counterpart in the preceding year.

In 1933-34 the total operating expenditures were \$1,040,418.94, as against \$1,046,328.47 in 1932-33.

Physical plant.—During the year 1933-34 the contract was let for the construction of the new classroom building at a cost of \$460,000 and considerable progress had been made in the construction of this new unit by the end of June. The contract had also been let for the erection of the new chemistry building at a cost of \$475,500. The

¹ Including extension fund \$122,051.50 as against \$51,815.61 the preceding year.

² Including reconditioning and repairs of \$77,801.85.

plans for the new heat, light, and power plant were ready for bids and the final plans for the new library were expected to be ready in August 1934. Considerable delay was caused in all this construction by the labor strikes incident to the new code arrangements. An appropriation of \$98,811 by the Public Works Administration enabled the university to carry through extensive alterations and repairs in connection with the buildings and grounds. This work was enhanced by additional allotments of labor and materials from the Civil Works Administration.

REPORT ON LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is authorized by Congress to require annual reports in detail from the treasurers of the several land-grant institutions of the disbursements of the annual income received by them under the Land Grant Act of 1862 and supplementary acts, and annual reports from the presidents regarding the general operations of the institutions. This duty has been assigned by the Secretary of the Interior to the Office of Education.

Land-grant colleges and universities, generally known as agricultural and mechanical colleges, were established following the passage of the first Morrill Act of 1862. By the terms of this act, each State was entitled to receive an amount of public land (or land scrip) equal to 30,000 acres for each Senator and Representative in Congress to which such State was then entitled for the "endowment, support, and maintenance of at least one college where the leading object shall be to teach such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life." This land is being gradually sold to create an endowment fund which in 1932-33 totaled \$22,781,465. In addition there remained more than \$6,000,000 worth of unsold land. The income from such fund and lands amounted to \$971,254 for that year.

By the second Morrill Act of 1890 and the Nelson amendment of 1907, the Federal Government aids these institutions further; since 1911 each State has received from the United States Treasury in accordance with the Morrill-Nelson Acts \$50,000 annually to be applied to salaries and facilities for instruction in specified subjects. Of the total appropriations in 1932-33 (\$2,550,000) spent for instruction in specific subjects. The expenditure for salaries was \$2,541,128 and \$18,537 for facilities for instruction. These figures include \$7,592 balance from previous year, and \$8,038 interest on deposits. Balance, \$5,962.78.

Thirty States and three Territories—Alaska, Hawaii, and Puerto Rico—maintain 1 land-grant institution each; Massachusetts maintains 2; and each of the 17 Southern States maintains 2, 1 for whites

and 1 for Negroes. About 175,000 regular students of college grade enroll annually during the academic year in the land-grant colleges, about 1 out of every 6 college students in the United States. The inventory of the land-grant institutions (1933) revealed that \$550,305,675 was invested in the 52 institutions for white students, of which half was in buildings. In 1932-33 the total receipts of the 69 institutions amounted to nearly \$140,000,000, of which there was derived from Federal funds a total of \$20,626,900.

Since 1890 the land-grant institutions have depended upon the prompt and regular annual payment during July of the Morrill-Nelson appropriations. On June 10, 1933, the President of the United States issued Executive Order No. 6166 affecting the payment of this money as follows:

SEC. 18. The following functions are abolished in part * * * Endowment and maintenance of the colleges for the benefit of agriculture and the mechanic arts, 25 percent thereof.

This order affected these continuing appropriations, and only 25 percent of the appropriation was mailed on August 2; another 50 percent was mailed during September. The question of the remaining 25 percent was in doubt until February 6, 1934, when in Executive Order No. 6585 President Roosevelt upon further investigation determined that the provisions of section 18 above-mentioned were not in the public interest or consistent with the efficient operation of the Government, and revoked the section. Shortly thereafter the final 25 percent payment of Morrill-Nelson moneys was made so that in the end the land-grant colleges received the same allotment as usual for 1933-34.

VOCATIONAL EDUCATION

LEGISLATIVE BASIS OF NATIONAL PROGRAMS

The Federal-State programs of Vocational Education and Vocational Rehabilitation have their basis in special acts of Congress and special State acceptance acts which provide appropriations of Federal and State matching funds for carrying on the work. The obvious intent of this Federal legislation is to stimulate and aid the States in maintaining specific types of vocational training and rehabilitation for workers in trade and industry and on the farm, and for homemaking, which would not otherwise be provided for in the regular public-school systems.

Acts administered by the Office of Education, under the direction of the Assistant Commissioner for Vocational Education, include the following:

The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)

The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of civilians disabled in industry or otherwise and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)

An act to provide for the vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)

An act (George-Reed) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1930 to 1934 additional appropriations for vocational agriculture and home economics. (Approved Feb. 5, 1929.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the island of Puerto Rico. (Approved Mar. 3, 1921.)

An act (George-Ellzey) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1935 to 1937, additional appropriations for vocational education. (Approved May 21, 1934.)

The George-Reed Act of 1929, authorizing annual appropriations for the 5 years 1930 to 1934, expired June 30, 1934, and Congress provided in the George-Ellzey Act of 1934 for continuation of annual appropriations during the years 1935, 1936, and 1937, additional, as were those of the George-Reed Act, to appropriations made by the Smith-Hughes Act. Allotments of appropriations made under this new act, based on the farm, the rural, and the nonfarm population of the States and Territories, were certified to the Treasury to be sent to the States in semiannual payments July 1 and January 1. Interpretation of the provisions of this act, and the formulation of policies to be followed in the States in utilization of the funds provided under it, especially with reference to utilization of these funds for the relief of unemployment, so far as the provisions of the act permit, has required special consideration by the Federal staff, and has necessitated a very considerable amount of correspondence and conference with State administrative and supervisory officials.

COOPERATIVE SERVICE TO THE STATES

Services rendered to the States in all fields of vocational education—agricultural, trade and industrial, commercial, home economics, and vocational rehabilitation—during the past year have dealt largely with emergency activities.

The staff has cooperated extensively with recovery agencies, one member of the trade and industrial staff devoting his entire time as liaison officer, to advise with the Administrator of the Federal Emer-

gency Relief Administration relative to the development of emergency relief programs in education and rehabilitation, and a member of the agricultural education staff devoting about half of his time to rendering similar service. Other staff members have assisted State departments in formulating plans for emergency relief educational programs. Services have been rendered also in connection with the organization of training programs for Civilian Conservation Corps camps, and for transient camps. These services have assisted the States in reorganizing their established vocational programs, State and local, and adapting them to the emergency situation. To this end conferences have been held with supervisors, teacher trainers, and teachers in all sections of the country.

At the same time the regular field services have been rendered during the past year as in other years, including the conduct of regional, State, and local conferences for administrators, supervisors, and teacher trainers to assist States and local communities in improving their regular vocational programs; inspection of schools; participation in summer conferences; and promotion of regular programs. Teacher training courses have been given by members of the staff at summer schools, and assistance rendered in organization of training programs to meet local community needs. These services rendered for the promotion of the established vocational and rehabilitation programs have extended to all of the States and to Hawaii and Puerto Rico.

The Farm Credit Administration, agricultural production-control, erosion-control, agricultural-planning, and land-utilization programs have developed new problems in farm financing, marketing, and management. The establishment of subsistence homesteads, the formulation of rural rehabilitation programs, the Emergency Relief Administration program of work relief for unemployed teachers, and the adoption of educational programs for Civilian Conservation Corps camps, as well as the continued backflow of population from city to country in the unemployment situation prevailing in industrial centers, and the unprecedented drought conditions, extending over a very large section of our agricultural areas, have created urgent demands for services of members of the agricultural education staff in cooperation with State staffs.

As a result of these concerted efforts the 5,000 agricultural teachers have been enabled to cooperate effectively in all sections of the country with Federal, State, and local agencies of agricultural adjustment and relief, in coordinating the established program of vocational agriculture with the programs of the newly established agencies.

In the field of trade and industrial education the reorganization of industry under the National Recovery Act has greatly increased the demand for conference work. Members of the trade and industrial

staff have conducted conferences in many of the States for training conference leaders and industrial supervisors. Surveys, either completed or in process during the year, have been made of changes in employment conditions under National Recovery Administration codes to determine specific needs for training; and an analysis made of all National Recovery Administration codes approved over a period of 6 months to determine provisions for apprentice training and for training adult workers in the codes.

Cooperative services have been rendered to assist States in reorganizing part-time general continuation schools, in developing multi-occupational programs, in developing training programs for selected industries and trades, in providing suitable training opportunities for boys and girls in the ages 14 to 18 who are not, in the present situation, being permitted to enter upon or continue in employment under State labor laws and National Recovery Administration codes, and in providing job-changing and occupational adjustment vocational training for unemployed adults.

The Federal home economics education staff has cooperated with the Federal Emergency Relief Administration at national headquarters in outlining and compiling materials to be distributed to the States to aid in the emergency work. It has cooperated with State staffs in safeguarding the welfare of the family under the prevailing conditions of unemployment and diminished family incomes. It has planned with State staffs for locating production and service jobs in the community, and devising ways and means for bringing the unemployed workers of families in contact with such jobs. It has assisted States in developing training programs for home makers based upon surveys of local conditions affecting home life, and of actual conditions found in individual homes. Particular emphasis has been given to the development of adult programs of consumer education for the training of homemakers as buyers for the family, and conservers of family resources, as well as producers in the home. Emphasis has also been placed upon adapting day and part-time homemaking programs to local home and family needs in the emergency, and aid has been given State and local staffs in establishing and maintaining through homemaking departments, free school lunches for needy children. To promote economical utilization of family resources homemaking programs have particularly emphasized instruction in canning, drying, and otherwise preserving foods for future use, in economical selection, preparation, and service of foods, in gardening for home consumption, in renovating, repairing, and constructing garments; in renovating to make still usable in the home, cast aside furniture and household furnishings; in encouraging simple arts and crafts in the home as a source of revenue and in planning, at little or no cost, wholesome family recreation.

Homemaking staffs and classes have cooperated in locating families without resources and in helping them to help themselves in all possible ways, and have cooperated extensively with State staffs in promoting recovery measures through conferences on consumer education held to develop ways and means for incorporating such education into school programs. Field services to aid the homemaking teachers, supervisors, and teacher training staffs in the States in promoting established programs of home economics have been continued during the year as in other years, by means of regional conferences, participation in State and local conferences, official visits to States, and distribution of helpful materials.

In the commercial field, service has been rendered in counseling and advising State and local school authorities in developing training programs for distributive occupations. In response to requests for such services, 13 cities were visited by a member of the Federal staff during the period covered by this report.

The year was characterized by expansion of the program for vocational rehabilitation of persons disabled in industry or otherwise and their return to employment. The State of Washington initiated its rehabilitation program at the beginning of the year, bringing the number of cooperating States under the national program to 45. Some indication of the extent to which the program has expanded and the demand for service to aid the States in promoting this work has increased, may be given by noting that the number of disabled persons rehabilitated and placed in employment increased 44 percent, and the number of persons served in the States increased 20 percent, over the year; that the scope of occupations in which the physically disabled are being rehabilitated has been broadened; that better cooperation has been secured from employers; that an increased personnel in the States has been provided for carrying on the work; that cooperation with other State and local agencies has been more effective; that new types of service have been rendered; and that material reduction in cost per case served has been effected. The expansion of this service bears evidence of increased support by the public, by employers, by other State and local departments of government, and generally by private agencies engaged in rendering different types of service for disadvantaged persons.

In part the expansion of the rehabilitation service has been made possible through Federal Emergency Relief Administration funds made available for allotment to the States in proportion to their population, needs, and ability to use this additional fund effectively.

During the year surveys were made to determine the number of disabled persons in selected cities, communities, or States. Earlier studies of this character had found the number to be approximately 6 per thousand population, but the surveys conducted during the past

year have found the number to be much greater. In the State of Mississippi, for example, which was completely covered by a house to house canvass, a recent survey found the number to be 30 per thousand population. On the basis of these more recent surveys the number of the permanently disabled persons may be conservatively estimated to range from 15 to 20 per thousand population.

Measures taken for the relief of unemployment under programs of vocational agriculture have included instruction in gardening in cooperation with organized charities; organization of class gardens for the needy of the community, and collection and processing of surplus foods for distribution to them; formulation of live-at-home programs for those with part-time employment; surveys of families returning to farms from industrial centers to determine their training needs; and training leaders for agricultural relief work. The 80,000 members of the Future Farmers of America also, comprising farm boys enrolled in vocational classes or graduates from such classes, have aided in rural relief work.

Unemployment in the trade and industrial field, as in other fields, is in large part a consequence of changing conditions, migrations of industries, mechanization of processes, introduction of labor saving machinery, substitution of mechanical power for man power, introduction of new materials and products, and the development of new technics of production. Such changes create demands for new trade skills and for occupational adjustment training of displaced labor groups. Vocational training agencies cannot create jobs for the unemployed, but training programs must be, and have during the past year been, continually modified to take account of the new requirements being imposed upon workers. Every effort has been made during the year, as, for example, through an extensive survey of changing economic and social conditions of the character noted above, to promote the development of programs to meet the needs of workers who have been thrown out of adjustment in their work environment and added to the number unemployed. Many adults in this situation have received instruction in vocational classes which has enabled them to secure employment.

As noted elsewhere, the home economics staff has cooperated in the unemployment situation with State staffs and with emergency recovery agencies through the formulation of programs of consumer education adapted to the needs of families with incomes reduced in consequence of unemployment of the family breadwinner. It has emphasized cleanliness, sanitation, and health in the home and the rendering of homes comfortable and attractive without money expenditure.

CONTRIBUTION TO THE RELIEF OF UNEMPLOYMENT

Provision of Federal Emergency Relief Administration funds enabled the States to make censuses of the disabled, survey industries for employment opportunities, and render constructive relief service in the form of vocational rehabilitation, thereby removing large numbers of the disabled from unemployment and dependency relief rolls, and enabling them to support themselves and in some instances their dependents. These programs have accordingly contributed materially to the relief of unemployment.

During the year cooperative working relations between State employment offices and rehabilitation departments have been set up in a number of States under section 7 of the Wagner-Peyser Act.

NEW PROBLEMS IN ALL-DAY SCHOOL VOCATIONAL PROGRAM

It may be noted that the public policy given effect under National Recovery Administration codes and child labor legislation, excluding from employment juniors 16 years of age and under, and in some States and some occupations those of more advanced ages, may be accepted as a permanent public policy for safeguarding the welfare of youths in these ages who in past years have entered part-time employment and attended part-time vocational schools. Temporarily this new policy has developed problems of unemployment and unadjustment among the youth of the population in all fields of vocational education. Effort has been made to bring these youths back into full-time school attendance, and to provide vocational programs in the day schools to meet the needs of such youths who, as is being generally realized, in many instances cannot benefit by additional instruction of academic character.

The character of the new and serious problems developing under National Recovery Administration codes and child-labor laws during the past year will be sufficiently obvious from the foregoing statement. In general these problems have developed in situations where school revenues have been reduced under pressure for economy and in the face of increasing enrollments of youths being excluded from employment and returned to the schools under compulsory attendance laws. Further problems have developed in respect to the conventional school program of instruction, which very generally has been developed along lines of academic disciplines, rather than of practical vocational interests. It is being realized that if these youths are to benefit from continued schooling, the instruction and training provided in the all-day school must be adapted to meet their needs and interests. The problems of the all-day school constitute in fact one large phase of the problem of our vocationally and socially unadjusted, and in many thousands of instances foot-loose, youths. In

the trade and industrial field especially these developments have meant practically complete discontinuance of the general continuation school for the 14- to 16-year-old group, and an increasing demand for expansion of full-time trade preparatory vocational programs.

APPRENTICE TRAINING

In another section of this report attention has been called to the establishment of a Federal committee on apprentice training by the Secretary of Labor under an Executive order of the President. A member of the trade and industrial staff has served on this committee as representative of the Division of Vocational Education of the Office of Education. The development of formal apprentice training plans under approved National Recovery Administration codes of fair competition will create new responsibilities for trade and industrial vocational programs, and new demands for service on the part of the Federal staff to aid the States in meeting these responsibilities.

OCCUPATIONAL ADJUSTMENT TRAINING

While in general working conditions for adult workers in different trades and industries have been improved under National Recovery Administration policies, many important questions involving the training of these workers have arisen. The new order of affairs with reduced hours and increased rates of wages has emphasized the importance of securing higher degrees of efficiency in the working personnel. Greater responsibility for securing and maintaining efficiency is being placed upon supervisory staffs throughout industry. Increasing opportunities for employment, following the prolonged period of depression, have developed new demands for occupational adjustment training to insure promotion of regularly employed workers to new jobs becoming available, to safeguard the welfare of workers in older age groups who require training in the new technics of industry or for new jobs in cases where the old job has been taken over by the machine or has been eliminated in the course of developing these new technics.

Under these conditions management in industry is realizing as never before the need for developing practical training programs that will up-grade their working personnel. Recent trends have been in the direction of a better understanding and a closer and more effective cooperative relationship between industrial leaders, labor groups, and State authorities responsible for the promotion of trade and industrial education.

PERMANENT vs. ANNUAL APPROPRIATIONS

Under the terms of the Smith-Hughes Act appropriations for vocational education were made permanent and continuing. This pro-

vision was written into the act to enable States accepting the act and local communities in these States to plan their budgets for utilizing Federal funds in advance, and with the definite assurance that Federal money would be available for reimbursement of their expenditures in designated amounts.

During the past year the general policy of making permanent continuing appropriations has been brought into question for Congressional inquiry, and after careful consideration of all conditions many such appropriations have been made subject to annual review by Congress. The Senate Committee on Appropriations of the last Congress, however, to whom the bill providing that certain continuing appropriations should in the future be subject to annual consideration and appropriation was submitted, recommended that the appropriations under the Vocational Education Act be continued as permanent appropriations, as provided in the original act. The committee reported that: "It is proper to make continuing appropriation of funds payable to the States so the legislatures thereof may unquestionably rely upon the receipt of such funds in making up State or county budgets."

RESEARCH

During the year the survey and analytical study of changing social and economic conditions and of the significance of these changes for programs of vocational education, begun 2 years ago at the request of the American Vocational Association, has been continued. This study has been made by a committee representing the agricultural, trade and industrial, and home economics staffs in the Vocational Education Division of the office. A general report covering the inquiry was in press at the close of the year.

Other research in progress during the year has included a study of sheet metal working in the aircraft industry to determine what should be included in a vocational training program for workers in this field; a study of retail salesmanship, to be used as a guide in adjusting commercial education training programs to include appropriate training for salesmen; a study of fireside or handicraft occupations, particularly in New England and Southern States; a study of the need and use of photographic films in vocational education; a cooperative survey of the vocational education needs of the city of Seattle; a survey made in cooperation with the American Vocational Association, State agricultural colleges, and other agencies, of investigations and studies in the field of agricultural education; a case study of former vocational agriculture students now operating farms; a study of potential locations for agricultural departments in high schools; a study of the organization of vocational agriculture training in small high schools; a study of possible bases for the evaluation of the home economics curriculum in high schools; curriculum revision

at all educational levels as it relates to home economics education; a study of consumer buying at the secondary school level; complete surveys of vocational rehabilitation programs in a number of States, six of which have been completed; a study of data to be incorporated in a handbook for rehabilitation workers; and a study of material to be incorporated in a bulletin on office procedure in vocational rehabilitation.

PUBLICATIONS

Vocational education publications issued during the year in the four fields—agricultural education, trade and industrial education, home economics education, and vocational rehabilitation—have included five publications prepared and issued by the agricultural service, as follows:

- The Earning Ability of Farmers Who Have Received Vocational Training. Bulletin 167.
- Analysis of Special Jobs for Farm Forestry. Bulletin 169.
- Emergency Programs of Vocational Agriculture. Bulletin 177.
- Reorganizing the Individual Farm Business. Monograph 18.
- Suggestions for Teaching the Job of Grading Feeder and Stocker Steers. Leaflet 4.

Publications prepared by the trade and industrial education service have included:

- Vocational Training for the Pulp and Paper Industry. Bulletin 168.
- The Status of Vocational Teacher Training in the Industrial Field. Bulletin 176.
- The Development of Social Intelligence Through Part-time Education. Bulletin 176.
- Apprenticeship in England, France, and Germany, a publication composed of reports made available through the Department of State.

One bulletin and several miscellaneous publications were issued by the Home Economics Service, as follows:

- The Home Project in Homemaking Education. Bulletin 170.
- Report of Committee on Training for Publicity. Miscellaneous 1484.
- Outcomes from Instructions in Homemaking. Miscellaneous 1496.
- Home Economics Content That Is Effective. Miscellaneous 1497.
- Homemaking Education in Relation to Recovery. Miscellaneous 1512.
- Description of Home Project Material for Use as Case Studies. Miscellaneous 1524.
- Summary of the Educational Program in Homemaking in the Central Region. Miscellaneous 1532.
- Securing and Interpreting Facts Regarding Family and Community Conditions Relative to Foods. Miscellaneous 1543.
- Management of a Play School. Miscellaneous 1544.
- Suggestions to Home Economics Teachers of High School and Adult Classes on Education of the Consumer Buyers. Miscellaneous 1550.

Vocational rehabilitation publications have included:

Office Procedure in Vocational Rehabilitation. Bulletin 171.

Manual for Case Workers. Bulletin 175.

Vocational Rehabilitation. Miscellaneous 1473.

In addition preliminary drafts of studies made in several of the different fields listed under "Research" have been prepared.

APPROPRIATIONS 1934 AND 1935

Table 1 shows vocational education and vocational rehabilitation appropriations for allotment to the States and Territories for the fiscal years 1934 and 1935, and table 2, allotments to the States under the several acts providing Federal funds for 1934.

The increases in appropriations shown for 1935 over 1934 represent in the case of the Smith-Hughes funds a restoration of these appropriations to the basic appropriations made in the Vocational Education Act of 1917. This act provides permanent and continuing appropriations for cooperative vocational education in agriculture, trades and industries, and home economics, and teacher training, which increased to a maximum of \$7,167,000, for 1926 and annually thereafter. The appropriations as provided in the act were made available each year from 1918 to 1932, inclusive. Under the Economy Act of June 30, 1932, the appropriations for 1933 were reduced by 10 percent, and this reduction was continued in 1934 under the acts of March 3 and March 20, 1933. Acting under authority of the act of March 20, 1933, the Bureau of the Budget further reduced these cooperative appropriations for 1934 by 15 percent of the portion estimated to be expended from the appropriations for salaries, and by 7.5 percent of a balance of the teacher-training appropriation.

The George-Reed Act of 1929 authorized additional appropriations for allotment to the States for vocational agriculture and home economics education of \$500,000 for 1930 and for each year thereafter for 4 years an amount exceeding by \$500,000 the appropriation of the preceding year. Under these provisions the following amounts were authorized: For 1930, \$500,000; for 1931, \$1,000,000; for 1932, \$1,500,000; for 1933, \$2,000,000; and for 1934, \$2,500,000. These amounts were made available to the States in the appropriations for 1930, 1931, and 1932. For 1933 the appropriation was continued in the same amount as for 1932. The appropriation for 1934 was continued in the same amount as for 1933, subject to the 15 percent reduction under the act of March 20, 1933.

The period of the George-Reed Act expired June 30, 1934, and in the George-Ellzey Act Congress authorized appropriations annually for the 3 years 1935, 1936, and 1937 in the amounts shown in table 2. The full amount authorized was appropriated for 1935.

Appropriations for Hawaii, Puerto Rico, and the District of Columbia, which had been reduced in 1934 under the economy and other acts, were restored for 1935 to the amounts authorized in the original acts.

Appropriations for administration of the acts, and for research and service to aid the States in developing their vocational education and vocational rehabilitation programs were in the following amounts for 1934 and 1935:

	1934	1935
Smith-Hughes Act.....	\$175,000	\$180,000
George-Reed Act.....	68,000	
George-Ellzey Act.....		60,000
Rehabilitation Act.....	55,000	58,000

TABLE 1.—*Appropriations for allotment to the States and Territories for vocational education and vocational rehabilitation: Years ending June 30, 1934 and 1935*

Appropriation	1934	1935
SMITH-HUGHES ACT		
Total.....	\$5,940,000.00	\$7,167,000.00
Vocational agriculture.....	2,520,000.00	3,027,000.00
Vocational trade, industry, and home economics.....	2,510,000.00	3,050,000.00
Vocational teacher training.....	910,000.00	1,090,000.00
GEORGE-REED ACT		
Total.....	1,275,000.00	
Vocational agriculture.....	637,500.00	
Vocational home economics.....	637,500.00	
GEORGE-ELLZEY ACT		
Total.....		3,084,603.00
Vocational agriculture.....		1,031,019.75
Vocational trade and industry.....		1,032,191.60
Vocational home economics.....		1,021,391.65
Vocational Rehabilitation Act.....	969,000.00	1,097,000.00
Hawaii.....	25,700.00	30,000.00
Puerto Rico.....	84,000.00	105,000.00
District of Columbia.....	11,000.00	15,000.00

TABLE 2.—Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation. Year ended June 30, 1934

State or Territory	Smith-Hughes Act ¹			George-Reed Act ²			
	Total	Vocational agricultural education	Vocational trade, industrial and home economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational home economics education
Total.....	\$ 5,940,000.00	\$ 2,520,000.00	\$ 2,510,000.00	\$ 910,000.00	\$ 1,275,000.00	\$ 637,500.00	\$ 637,500.00
Alabama.....	133,411.27	88,499.13	26,843.84	18,068.30	50,333.18	27,896.78	22,436.40
Arizona.....	29,875.65	13,294.45	8,231.49	8,349.71	5,430.92	2,060.50	3,370.42
Arkansas.....	68,945.46	68,473.92	13,809.34	12,662.20	40,660.31	23,300.73	17,359.58
California.....	259,394.86	70,570.15	150,061.04	38,763.67	30,806.35	12,915.33	17,891.02
Colorado.....	51,105.71	24,005.31	18,750.69	8,349.71	11,972.66	5,886.81	6,085.85
Connecticut.....	73,899.53	22,107.99	40,819.77	10,971.77	7,410.89	1,806.05	5,604.84
Delaware.....	24,928.74	8,347.54	8,231.49	9,683.71	8,340.00	1,359.34	6,980.66
Florida.....	145,822.65	32,963.48	27,403.06	10,024.79	14,163.70	5,806.76	8,356.94
Georgia.....	70,391.33	93,665.79	32,297.89	19,858.97	53,271.47	29,525.22	23,746.25
Idaho.....	31,262.62	14,681.42	8,231.49	8,349.71	7,642.71	3,920.66	3,722.05
Illinois.....	348,190.40	92,824.21	203,264.89	52,101.30	44,331.45	20,798.56	23,532.89
Indiana.....	154,009.82	67,124.87	64,772.79	22,112.16	33,939.65	16,922.08	17,017.57
Iowa.....	121,598.15	69,406.52	35,920.32	16,871.31	37,930.34	20,354.32	17,576.02
Kansas.....	92,730.18	53,563.85	28,323.07	12,843.26	28,289.27	14,719.71	13,569.56
Kentucky.....	103,415.65	42,090.01	22,141.48	17,852.14	45,905.44	24,488.39	21,417.05
Louisiana.....	22,141.48	39,005.04	30,063.16	14,349.45	32,246.90	17,288.39	14,958.51
Maine.....	42,090.01	11,595.82	11,595.82	8,349.71	9,173.21	3,559.12	5,614.09
Maryland.....	186,663.05	30,554.33	35,160.80	11,139.88	12,688.62	4,942.45	7,746.17
Massachusetts.....	223,827.51	71,668.03	119,096.60	29,015.91	7,498.55	2,565.45	4,933.10
Michigan.....	123,649.10	60,784.02	45,358.69	17,506.39	34,454.25	16,284.90	18,169.35
Minnesota.....	103,694.71	77,750.49	12,221.37	13,722.85	34,045.99	18,635.96	15,410.03
Mississippi.....	174,204.01	82,369.86	67,053.22	24,780.93	44,079.58	23,197.08	20,882.50
Montana.....	33,172.44	16,591.24	8,231.49	8,349.71	8,464.69	4,238.46	4,226.23
Nebraska.....	68,439.28	41,498.17	17,532.52	9,408.39	22,711.55	12,190.89	10,520.66
Nevada.....	24,928.74	8,347.54	8,231.49	8,349.71	1,009.81	342.21	667.60
New Hampshire.....	27,142.65	8,943.74	9,849.20	8,349.71	3,575.60	1,308.17	2,267.43

¹ Appropriations for allotment for 1933 were reduced by 10 percent below the basic appropriations provided in the Smith-Hughes Act. Appropriations for allotment for 1934 were reduced below the 1933 appropriations by the Director of the Bureau of the Budget, under the Act of Mar. 20, 1933.

² The amount originally authorized for 1934 under the George-Reed Act was \$2,500,000, but this authorization was automatically reduced to \$2,000,000 by reduction of the appropriation for 1933 below the authorization for 1933. The amount appropriated for 1934 was \$1,275,000 as shown in the table.

³ The Independent Offices Appropriation Act, 1934, appropriated \$969,000 for vocational rehabilitation and provided that the minimum allotment to any State for the fiscal year 1934 should be \$8,840.

⁴ The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

TABLE 2.—Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation. Year ended June 30, 1934—Continued

State or Territory	Smith-Hughes Act			George-Reed Act			Vocational Rehabilitation Act
	Total	Vocational agricultural education	Vocational trade, industrial and home economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational home economics education
New Jersey.....	\$180,609.32	\$32,668.34	\$120,437.18	\$27,593.80	\$11,010.77	\$2,728.66	\$29,411.89
New Mexico.....	31,308.03	14,726.83	8,231.49	8,349.71	7,035.34	3,301.78	8,840.00
New York.....	561,583.86	96,136.54	379,497.33	85,949.99	39,357.38	14,984.74	91,613.01
North Carolina.....	160,686.29	109,831.06	29,208.92	21,646.31	61,145.49	33,301.00	23,072.53
North Dakota.....	42,988.80	26,407.66	8,231.49	8,349.71	14,964.25	8,269.25	8,840.00
Ohio.....	307,494.29	99,583.10	162,568.25	45,382.94	46,325.82	21,089.54	48,373.11
Oklahoma.....	119,250.76	73,255.12	17,663.77	16,359.91	39,886.91	21,315.19	17,437.82
Oregon.....	47,605.32	21,591.84	22,918.15	8,349.71	10,129.44	4,653.45	8,840.00
Pennsylvania.....	445,550.12	144,142.84	235,645.44	65,761.84	54,374.04	17,831.89	70,094.72
Rhode Island.....	39,615.40	8,347.54	13,383.82	8,349.71	957.17	342.96	8,840.00
South Carolina.....	88,894.48	63,638.56	13,231.49	11,872.10	35,209.31	19,075.60	12,654.33
South Dakota.....	42,728.43	26,147.23	8,231.49	8,349.71	14,750.57	8,121.80	8,840.00
Tennessee.....	130,233.83	80,032.65	32,335.61	17,865.57	45,588.61	25,298.65	19,042.68
Texas.....	285,795.68	159,848.05	86,177.09	39,770.54	89,485.48	48,960.63	42,390.91
Utah.....	29,194.00	11,240.89	9,603.40	8,349.71	5,258.27	2,408.47	8,840.00
Vermont.....	27,787.75	11,206.55	8,231.49	8,349.71	5,191.11	2,350.01	8,840.00
Virginia.....	121,006.15	76,137.89	28,332.12	16,536.14	39,091.80	19,789.24	17,625.67
Washington.....	74,164.85	31,587.30	31,902.85	10,674.70	14,350.90	6,342.85	11,378.03
West Virginia.....	87,124.39	57,590.39	17,727.17	11,806.83	23,948.32	9,347.94	12,584.75
Wisconsin.....	140,561.78	56,042.76	56,042.76	20,067.22	34,678.31	18,338.42	21,389.40
Wyoming.....	24,928.74	8,347.54	8,231.49	8,349.71	3,356.56	1,522.60	8,840.00
Alaska.....	25,700.00	8,500.00	8,500.00	8,700.00	678.14	31.35	606.79
Hawaii.....	84,000.00	24,000.00	84,000.00	12,000.00	5,752.54	3,742.45	2,010.09
Puerto Rico.....							

4 The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

5 Trade and industrial education, \$24,000; home economics education, \$24,000.

GENERAL EDUCATION BOARD

REPORT OF THE TREASURER

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1934, principal fund, belonging without restriction to the Board, amounted to \$45,664,670.50. This fund is invested in stocks and bonds. In addition the sum of \$10,847,681.41 is reserved to pay appropriations to various educational institutions. This fund is also invested in stocks and bonds. Lapses and refunds on prior years' appropriations amounted to \$2,896,003.75 and \$526.60 respectively. The sum of \$2,634,655.06 was paid during the year ended June 30, 1934.

Appropriations from income during the year aggregated \$3,028,723.93. Lapses on account of prior years' appropriations amounted to \$1,214,971.55, however, leaving a net increase in income appropriations of \$1,813,752.38.

The income from the above funds, together with income from undisbursed income (and including the sum of \$252.19 received on account of income from the estate of Lucy M. Spelman) amounted during the year to \$2,498,252.79. The balance of income from the previous year as of June 30, 1933, amounting to \$11,955,984.86, together with sundry refunds amounting to \$19.85, increased the total to \$14,454,257.50.

Disbursements from income during the year were as follows:

WHITES

Colleges of liberal arts: General endowment, buildings and other purposes.....	\$159, 673. 72
Science of education:	
Schools of education.....	\$83, 885. 22
Special projects.....	325, 663. 56
	<hr/>
	409, 548. 78
Natural sciences.....	57, 455. 17
Social sciences.....	9, 187. 86

WHITES—continued

Medical sciences:		
Schools of medicine	\$250, 763. 18	
Special projects	18, 563. 85	
		\$269, 327. 03
Humanities		187, 511. 19
Industrial art		905. 35
Public education:		
Fellowships	\$26, 522. 73	
Special divisions in State departments of education	188, 208. 72	
Teacher training	128, 496. 76	
Library training	37, 035. 16	
Studies	16, 091. 26	
Other purposes	11, 615. 38	
		407, 970. 01
Miscellaneous		33, 428. 09
General education		150, 070. 43
Child growth and development		90, 412. 23
Training of personnel for the advancement of knowledge		15, 410. 95
		\$1, 790, 900. 81

NEGROES

Colleges and schools: General endowment, buildings and other purposes		
	\$480, 800. 74	
Natural sciences	10, 407. 19	
Social sciences	10, 000. 00	
Medical sciences:		
Schools of medicine	\$205, 274. 78	
Special projects	6, 043. 49	
		211, 318. 27
Public education:		
Summer schools	5, 948. 72	
Anna T. Jeanes foundation	40, 000. 00	
John F. Slater fund	37, 500. 00	
Rural school agents	123, 664. 22	
Fellowships	54, 451. 83	
Special divisions in State departments of education	3, 000. 00	
Teacher training	3, 000. 00	
Other purposes	7, 641. 38	
		275, 206. 15
Miscellaneous	7, 272. 16	
		995, 004. 51
Surveys and studies		5, 800. 35
Miscellaneous projects		7, 505. 19
Administration		320, 114. 20
		3, 119, 325. 06

This leaves an undisbursed balance of income on June 30, 1934, of \$11,334,932.44, which is invested as follows: Securities, \$7,278,453.47; certificates of deposit, \$1,500,000; cash on deposit, \$2,280,842.57; and

accounts receivable, net \$275,636.40. It should be noted, however, that against this balance of \$11,334,932.44 there are unpaid appropriations amounting to \$8,202,675.97, leaving unappropriated income amounting to \$3,132,256.47.

The Anna T. Jeanes fund, the principal and income of which are to be used for Negro rural schools, amounted, on June 30, 1934, to \$157,744.16. This sum is invested as follows: Bonds, \$82,839.16; stocks, \$16,645; and cash on deposit, \$58,260. During the year the sum of \$26,750 was appropriated from principal, which added to the balance unpaid June 30, 1933, totaled \$31,740. Payments during the year amounted to \$28,742.50, leaving \$2,997.50 available for unpaid appropriations.

The income from this fund during the year was \$5,329.14. Added to the balance from previous year, the total available income amounted to \$8,627.46. The sum of \$2,619.69 was paid, leaving \$6,007.77 accounted for in cash on deposit. There were no unpaid appropriations from income outstanding June 30, 1934, therefore this sum was available for appropriation.

BUREAU OF MINES

SCOTT TURNER, Director

FINANCES

The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1934, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were \$1,885,586.04. Of this amount \$1,481,111.98 was spent, leaving an unexpended balance of \$404,474.06. Owing to uncompleted work in the helium program for the Army and Navy there was a carry-over of \$53,895.04 of helium-plant funds of which \$50,000 was reappropriated for the fiscal year 1935.

On the regular work of the Bureau \$1,254,695.90 was expended; this figure is subject to slight corrections due to unpaid obligations.

In addition, for the helium program, which is purely service work for the Army and Navy and has no part in the regular plans of the Bureau, \$237,056.04 was appropriated directly to the Bureau, and \$64,000 was transferred from the Army and Navy for the purchase at cost of helium produced by the Bureau for national defense. Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910.

TABLE 1.—Bureau of Mines appropriations and expenditures, fiscal years ended June 30, 1911–34

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments ¹	Funds transferred from other agencies ²	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items ³
1911	\$502,200.00	\$34,200.00		\$536,400.00	\$22,818.27	\$513,581.73	\$513,581.73
1912	475,500.00	45,640.00		521,140.00	6,239.77	514,900.23	514,900.23
1913	583,100.00	47,850.00		630,950.00	4,087.20	626,862.80	626,862.80
1914	664,000.00	57,307.79		721,307.79	4,678.29	716,629.50	716,629.50
1915	730,500.00	55,424.60		785,924.60	4,178.11	781,746.49	781,746.49
1916	757,300.00	48,710.87		806,010.87	9,058.63	796,952.24	796,952.24
1917	981,060.00	52,400.00		1,033,460.00	48,588.10	984,871.90	984,871.90
1918	1,467,070.00	51,901.98	\$3,062,000.00	4,580,971.98	395,745.10	4,185,226.88	1,172,939.64
1919	⁴ 3,245,285.00	49,542.86	⁵ 8,600,000.00	11,894,827.86	⁶ 2,452,236.78	9,442,591.08	1,137,471.37
1920	1,216,897.00	52,800.00		1,269,697.00	9,592.18	1,260,104.82	1,245,891.36
1921	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923	1,580,900.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928	3,025,150.00	113,266.45	328,000.00	3,466,416.45	⁷ 736,235.62	2,730,180.83	1,997,270.66
1929	2,725,118.00	103,000.00	205,500.00	⁷ 3,753,094.67	⁸ 152,701.34	3,600,393.33	2,280,960.68
1930	2,274,670.00	123,300.00	166,200.00	⁸ 2,684,386.38	⁹ 135,714.93	2,548,671.45	2,216,995.72
1931	2,745,060.00	120,680.91	166,500.00	⁹ 3,134,595.10	¹⁰ 195,534.37	2,939,060.73	2,304,121.45
1932	2,278,765.00	137,866.48	194,500.00	¹⁰ 2,770,712.18	¹¹ 344,689.43	2,426,022.75	2,186,799.92
1933	1,860,325.00	75,100.00	221,808.42	¹¹ 2,398,947.38	¹² 491,052.22	1,907,895.16	1,710,762.02
1934	1,574,300.00	50,230.00	77,000.00	¹² 1,885,586.04	¹³ 404,474.06	1,481,111.98	1,254,695.90
Total	39,126,779.00	1,696,328.35	15,387,315.43	57,737,820.72	5,714,281.52	52,023,539.20	34,550,786.33
1935	¹⁴ 1,258,877.00	50,000.00	127,000.00	¹³ 1,485,877.00			¹⁵ 1,308,877.00

¹ Includes printing and binding, stationery, and contingent funds.² Includes proceeds from sales of residue gas.³ Service items include Government fuel yards, helium, and other investigations and services for other departments.⁴ Includes gas investigations for War Department.⁵ Includes \$1,586,388 for Government fuel yards.⁶ Includes War Minerals Relief Commission \$8,500,000.⁷ Includes \$719,476.67 unexpended balance reappropriated.⁸ Includes \$120,216.38 unexpended balance reappropriated.⁹ Includes \$102,354.19 unexpended balance reappropriated.¹⁰ Includes \$159,580.70 unexpended balance reappropriated.¹¹ Includes \$214,713.96 unexpended balance reappropriated.¹² Includes \$184,056.04 unexpended balance reappropriated.¹³ Includes \$50,000 unexpended balance reappropriated.¹⁴ Includes 5 percent salary restoration.¹⁵ Estimated.

A statement of the distribution of congressional appropriations to the branches and divisions within the Bureau and the expenditures of these funds in 1934 by the various divisions of the Bureau is given in table 2.

TABLE 2.—Bureau of Mines expenditures, fiscal year 1934

Branch or division	General expenses	Operating rescue cars and stations and investigation of accidents	Mining investigations in Alaska	Testing fuel	Mineral mining investigations	Oil and gas investigations	Expenses, mining experiment stations	Care, etc., buildings and grounds, Pittsburgh, Pa.
Office of the Director.....	\$10,572.95							
Office of the Assistant to the Director.....	7,896.65							
Administrative Branch:								
Office-Administration Division.....	23,105.34	\$18,559.67		\$310.46	\$1,279.09	\$880.38		
Information Division.....	6,286.25	11,920.23	\$539.58	5,681.75	4,964.53	6,592.63	\$7,500.25	\$2,387.03
Total.....	29,391.59	30,479.90	539.58	5,992.21	6,243.62	7,473.01	7,500.25	2,387.03
Office of Chief Mining Engineer.....		23,429.67						
Technologic Branch:								
Experiment-Stations Division.....		110,981.58		50,533.46	2,002.99		55,348.61	54,849.37
Explosives Division.....		27,755.28						
Mechanical Division.....		33,432.97	5,615.09	40,762.19				
Metallurgical Division.....					35,336.28		64,180.28	
Mining Division.....		3,918.86			41,737.75			
Petroleum and Natural-Gas Division.....						104,210.44		
Total.....		176,088.69	5,615.09	91,295.65	79,077.02	104,210.44	119,528.89	54,849.37
Economics Branch:								
Coal Division.....								
Common-Metals Division.....								
Mineral-Statistics Division.....								
Office of Principal Mineralogist.....								
Petroleum-Economics Division.....								
Rare-Metals and Nonmetals Division.....								
Total.....								
Health and Safety Branch:								
Demographical Division.....		19,645.49						
Safety Division.....		211,874.26						
Total.....		231,519.75						
Total appropriations.....	64,500.00	614,000.00	8,300.00	131,000.00	115,000.00	150,000.00	171,000.00	60,000.00
Total expenditures.....	47,861.19	461,518.01	6,154.67	97,287.86	85,320.64	111,683.45	127,029.14	57,236.42
Unexpended balances.....	16,638.81	152,481.99	2,145.33	33,712.14	29,679.36	38,316.55	43,970.86	2,763.58

TABLE 2.—Bureau of Mines expenditures, fiscal year 1934—Continued

Branch or division	Helium investigations	Economics of mineral industries	Helium plants	Helium production	Gas production	Printing and binding	Department contingent	Total
Office of the Director.....	-----	-----	-----	-----	-----	-----	-----	\$10,572.95
Office of the Assistant to the Director.....	-----	-----	-----	-----	-----	-----	-----	7,896.65
Administrative Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Office-Administration Division.....	\$1,786.85	\$9,441.90	-----	\$3,804.70	-----	\$5,156.05	\$13,230.00	75,767.59
Information Division.....	-----	10,543.61	-----	-----	-----	537.07	-----	58,739.89
Total.....	1,786.85	19,985.51	-----	3,804.70	-----	5,693.12	13,230.00	134,507.39
Office of Chief Mining Engineer.....	-----	-----	-----	-----	-----	-----	-----	23,429.67
Technologic Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Experiment-Stations Division.....	-----	-----	-----	-----	-----	20.28	-----	273,736.29
Explosives Division.....	-----	-----	-----	-----	-----	-----	-----	27,755.28
Mechanical Division.....	-----	-----	-----	-----	-----	616.87	-----	80,427.12
Metallurgical Division.....	-----	-----	-----	-----	-----	775.34	-----	100,291.90
Mining Division.....	-----	-----	-----	-----	-----	741.39	-----	46,398.00
Petroleum and Natural-Gas Division.....	27,618.56	-----	\$130,161.00	57,359.18	\$5,685.79	1,878.24	-----	326,913.21
Total.....	27,618.56	-----	130,161.00	57,359.18	5,685.79	4,032.12	-----	855,521.80
Economics Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Coal Division.....	-----	44,056.47	-----	-----	-----	-----	-----	44,056.47
Common-Metals Division.....	-----	17,233.39	-----	-----	-----	-----	-----	17,233.39
Mineral-Statistics Division.....	-----	77,118.93	-----	-----	-----	21,992.44	-----	99,111.37
Office of Principal Mineralogist.....	-----	6,022.93	-----	-----	-----	-----	-----	6,022.93
Petroleum-Economics Division.....	-----	24,996.60	-----	-----	-----	-----	-----	24,996.60
Rare-Metals and Nonmetals Division.....	-----	20,960.69	-----	-----	-----	-----	-----	20,960.69
Total.....	-----	190,389.01	-----	-----	-----	21,992.44	-----	212,381.45
Health and Safety Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Demographical Division.....	-----	-----	-----	-----	-----	2,730.63	-----	22,376.12
Safety Division.....	-----	-----	-----	-----	-----	2,551.69	-----	214,425.95
Total.....	-----	-----	-----	-----	-----	5,282.32	-----	236,802.07
Total appropriations.....	40,000.00	220,500.00	184,056.04	64,000.00	13,000.00	37,000.00	13,230.00	1,885,586.04
Total expenditures.....	29,405.41	210,374.52	130,161.00	61,163.88	5,685.79	37,000.00	13,230.00	1,481,111.98
Unexpended balances.....	10,594.59	10,125.48	53,895.04	2,836.12	7,314.21	-----	-----	404,474.06

ORGANIZATION

It is the province of the Bureau of Mines to study methods of producing, treating, and utilizing ores, mineral oils, gases, and other mineral substances. The purpose is to reduce or prevent waste in the mining, quarrying, metallurgical, and other mineral industries, to conserve the country's resources, and to safeguard the health and lives of miners. The Bureau is specially charged to study the causes of mine accidents and the means of preventing them; to conduct research in the use of coal, oil, and other fuels; and to make economic studies of the various mineral industries. Investigation of the causes and prevention of mine accidents includes research on explosives and tests of mechanical equipment used in mines and quarries, while economic studies include compilation of statistics on the production and consumption of minerals.

The Bureau is essentially a field organization, with administrative headquarters in Washington and with experiment stations and field offices in the several mining and oil-producing regions of the country. It is organized in four branches—Technologic, Health and Safety, Economics, and Administrative.

Technologic work.—The Technologic Branch, which conducts most of the research investigations other than those pertaining to safety and health, consists of six divisions; Mechanical, Mining, Metallurgical, Petroleum and Natural Gas, Experiment Stations, and Explosives.

The Mechanical Division is charged particularly with the study of problems of fuel utilization and investigations dealing with mining machinery, especially electrical equipment used in mining. The Mining Division gives attention to problems of economy and efficiency in mining, and the prevention of accidents. The Metallurgical Division deals with problems of efficiency in the treatment of ferrous and nonferrous metals. The Petroleum and Natural-Gas Division is concerned with the production, transportation, treatment, and utilization of these products. The Experiment-Stations Division administers the 11 experiment stations (at Pittsburgh, Pa.; New Brunswick, N.J.; Minneapolis, Minn.; Tuscaloosa, Ala.; Rolla, Mo.; Bartlesville, Okla.; Reno, Nev.; Salt Lake City, Utah; Tucson, Ariz.; Berkeley, Calif.; and Seattle, Wash.), where most of the research investigations of the Bureau are conducted. Each station gives special attention to the problems of the mineral industries of the adjacent regions. The Explosives Division studies the safe use of explosives in mining, with particular emphasis on "permissible explosives."

Economics in mining and marketing of minerals.—The Economics Branch, which was established on January 1, 1926, conducts studies dealing with economic conditions and problems, as distinguished from scientific and technologic problems of the mineral industries.

The branch comprises 5 divisions: Coal, Mineral Statistics, Petroleum Economics, Rare Metals and Nonmetals, and Common Metals. These divisions collect, analyze, and publish data relating to economics of various mineral commodities.

Health and safety work.—The Health and Safety Branch investigates hazards affecting the health and safety of workers in the mineral industries and includes the Health, Safety, and Demographical divisions. The work of the Health Division, which was chiefly investigative and concerned physical conditions affecting the health of workers, was recessed during the fiscal year 1934 because of lack of funds. The major activity of the Safety Division is instruction in mine safety and accident prevention and in mine rescue and recovery work; investigations include studies of causes of accidents and methods of prevention. The Demographical Division collects statistics covering accidents in the mining and metallurgical industries and the production of explosives.

Administrative Branch.—The Administrative Branch is composed of the Office-Administration Division and the Information Division; the chief of the branch also acts as assistant to the Director of the Bureau. The Office-Administration Division handles general routine business of the Bureau under the supervision of the chief clerk, and is composed of accounts, personnel, clerical assignment, legal, multi-graphing, mails and files, and property sections. The Information Division edits and supervises the publication of results of Bureau investigations, answers inquiries regarding the work or publications of the Bureau, and is responsible for motion-picture production and distribution. It is composed of the publications, editorial, motion-picture production, library, and graphic sections.

TECHNOLOGIC BRANCH

MECHANICAL DIVISION

Electrical section.—A supplementary testing station was established at Roslyn, Wash., and operated for a time to determine the permissibility of certain electrical equipment used in coal mines in that State.

Cooperation with the Underwriters' Laboratories regarding requirements of the two organizations for approval of devices was completed. A single schedule would require additional refinements not thought necessary for mining machinery.

Thirty-seven new designs of electrical equipment met the Bureau's requirements, 110 approvals previously granted were extended to cover changes in design, and three trailing cables were tested and listed as "specially recommended." The maintenance of permissible electrical equipment in a safe condition was studied in six mines.

Use of fuels.—A bulletin was published giving quantitative experimental data on the principles of underfeed combustion, which were so illustrated and expressed for the first time. The report furnishes rational information for use in the design of stokers using the underfeed principle.

The removal of ash as a fluid from furnaces using powdered coal requires knowledge of the fluid properties of the complex slags produced. The results of 5 years of study on the subject were presented to the American Society of Mechanical Engineers; they were highly commended as promoting this method of ash disposal and thus enlarging the market for coals having the lower fusing temperature of ash.

Fuel-economy service.—The fuel-economy service for Government plants is a connecting link between the Bureau's fuel studies and the use of fuels by the Government and consists of fuel-efficiency tests, the selection of fuels, power-plant advice, equipment-acceptance tests, and general consulting service to many Government departments on fuel problems, all with the object of economy. Many thousands of dollars are saved the Government each year from this work. A Bureau fuel engineer served as chairman of the fuel committee of the Procurement Division, Treasury Department. The coal purchases, methods of award, and specifications used by the various agencies throughout the entire Government were studied. Standard analytical specification limits for different coal areas were developed. Many changes and recommendations were made which are being adopted rapidly by the various Departments.

Fuel inspection and coal analysis.—The most extensive and impartial body of information regarding the quality of American coal is gathered, compared, and compiled by the Bureau's Fuel Inspection Service. By the aid of this information Federal departments are helped to select their coal and advised as to the quality of coal shipped on their contracts. During 1934, the Bureau analyzed 6,066 samples of coal and coke bought on Government specifications, 1,134 samples incident to research work, and 171 miscellaneous samples. Fifty-four samples were collected at bituminous-mine tipples, 67 at anthracite breakers, and 17 at tidewater piers. The section acted in an advisory capacity in rewriting coal specifications for the entire Federal service.

Constitution of coal.—At the request of the Pennsylvania State Geological Survey the coal beds of the Brookville area, in western Pennsylvania, are being correlated by means of characteristic plant constituents shown by microscopic examination. The coals involved are the Lower Kittanning, Clarion Rider, Clarion, Brookville, Upper Mercer, and Lower Mercer.

The Bureau's continued cooperation with scientific associations during the past several years resulted in the development of a system

of classification of coal by rank based on fixed carbon and British thermal units. Coals are grouped according to their degree of metamorphism in the natural series from lignite to anthracite. This classification scheme, based on an intensive study of numerous American coals, was accepted as a tentative standard by the American Society for Testing Materials and will be presented to the American Standards Association for approval.

Carbonization and byproducts of coal.—A survey of the gas-, coke-, and byproduct-making properties of American coals, begun in 1929, was extended to cover five additional coals. A monograph covering the first 30 coals of the survey, giving complete tabular data on their carbonizing properties as well as their physical and chemical properties, was prepared.

A very small-scale laboratory method having some merit for evaluating the coke-, gas-, and byproduct-making properties of coals was devised.

A small-scale laboratory test was developed for obtaining information regarding the caking properties of coals. The method is an approximate measure of the amount of that material in coal which fuses and becomes plastic on heating.

Sections of high-volatile gas coal heated in an inert gas at various temperatures revealed through the microscope the initial stages of coke formation and the temperatures at which the several microscopically visible constituents of coal fuse and swell.

Physical chemistry.—Processes have been developed on a laboratory scale for producing acetylene from methane, the chief constituent of natural gas, and for producing gasoline and lubricating oil from ethylene, which is readily obtained by thermal decomposition of natural gas. An equation has been developed that permits calculation of the yields of acetylene from methane under any given set of conditions.

Calculation of thermodynamic functions of hydrocarbon gases has been applied to all available spectroscopic data for hydrocarbon gases and has given the most accurate values of heat capacities and free energies yet obtained.

By studying the mechanism of gas explosions a new theory of flame propagation was developed. The use of explosion data for calculating specific heats of gases at high temperatures was demonstrated. All these fundamental theories and energy relations in gas explosions shed light on the way explosions occur in mines and on means for their prevention.

Conclusions.—Since no fundamental data are available on the comparative carbonizing properties of American coals, such as those obtained by the Bureau of Mines-American Gas Association method, there is need for extending the survey to cover all coals of the country suitable for carbonizing purposes.

Future work should stress the effect of blending, washing, and weathering or mild oxidation on carbonizing properties. Continued and repeated requests by subdivisional code authorities and others for unprejudiced and reliable information on composition and properties of American coals indicate that the Bureau should conduct such work. Facilities are adequate, but the available personnel should be increased.

MINING DIVISION

Metal mining.—The study of metal mining and milling methods and costs, one of the principal problems of the Mining Division for several years, has resulted in an interchange of technical and cost data invaluable to mine operators. Individual papers have now been published on most of the large metal mines and mills in this country, as well as representative establishments in Canada, Mexico, and Cuba. Moreover, summary papers have been prepared on each of the mining methods and on certain primary mining and milling problems presenting technical developments and costs. Bulletins on gold-mining, mine-accounting, shaft-sinking, and underground scraper practice have been published, and bulletin manuscripts on lead-zinc, copper, tungsten, placer mining, mining copper concentrates, metal-mine ventilation, and use of airplanes in mining were completed. As these manuscripts could not be published due to lack of printing funds, abstracts for mimeographing have been made of the manuscripts except that on ventilation.

This year greater attention has been given to the problems of small-mine operators. There has been a growing demand for information on methods of exploration, mining and treatment costs, types of equipment, and plant costs for small operations. Field work on methods and costs of developing and equipping small mines was begun during the winter of 1933, and this direct field contact by Bureau engineers with the operators has already resulted in an interchange of technical details and costs among the small operators, causing less wasted effort and expenditure and more intelligent planning of operations. Certain outstanding examples of good practice were selected and papers prepared, describing their operations in detail. Eight have already been issued, and six are in course of editing and publication. A general summary of these field studies was completed and is being issued as Information Circular 6800. Of general interest to mine owners is Information Circular 6748, *Essentials for a Preliminary Report on a Small Lode-Gold Mine or Prospect*, with Notes on Sampling, and Information Circular 6774, *Leasing System as Applied to Metal Mining*, both of which were issued during the year.

The chapter on mercury was prepared for the Minerals Yearbook.

Nonmetal mining.—Information circulars giving operating costs and technical details of the mining methods used at one crushed-stone quarry and one underground limestone mine were issued during the year. The latter paper is of especial interest to engineers, as it describes the first attempt at mining limestone by caving methods for its value as stone only. A report was compiled which collects recent information on the mining, processing, grading, and uses of mica. Because operators in the nonmetallic field were unwilling to prepare papers without compensation, insufficient material was received to supply the data necessary for additional detailed studies of the various operating steps in nonmetallic mining. In consequence, the working plan of the section was altered and this phase left for future development when funds are available. Instead, attention was necessarily directed toward assembling available information in a series of papers dealing with the technical problems involved in mining and treating nonmetallic minerals, by commodities. Compilation of five parts of the third paper in the series on sand and gravel production, entitled "Excavation," was completed.

Plotting the location of the principal producing nonmetallic deposits on maps of the States was begun; separate maps are being made for related commodities. Such information is helpful in determining the relative importance of producing areas and as a guide in planning technologic studies. Owing to the transfer of section personnel this work was suspended temporarily.

Publications of the division are being cataloged and indexed to provide a cross reference for producers searching for comparative information on operating details concerning both metals and non-metals. This work was also suspended temporarily due to lack of personnel.

The chapter on crushed and broken stone was prepared for the Minerals Yearbook.

Geophysics.—The geophysics section has contributed valuable improvements to seismic, magnetic, and resistivity methods of geophysical prospecting. Field work was performed with the magnetometer in determining the underlying geologic structure of Government helium properties in Texas and with the potentiometer in determining the depth of bedrock at the Grand Coulee Dam site in the State of Washington. Application of the magnetometer in outlining large magnetite-hematite deposits in Puerto Rico was also successfully demonstrated. Geophysical apparatus for measuring the vibration of ground due to nearby blasting operations was designed, constructed, and tested in the field with satisfactory results.

The abstracts of articles on geophysical prospecting, particularly those published in foreign countries, were issued each month; an information circular, Patents on Geophysical Prospecting Issued in

the United States, England, Canada, Germany, France, and Russia, was prepared for publication; and a technical paper, Induction Prospecting for Shallow Ore Deposits and Small Metallic Objects, will be issued soon.

Falls of roof and coal.—Owing to curtailment in appropriations, it was necessary to suspend the important and valuable studies of falls of roof and coal on July 15, 1933.

Ventilation.—Ventilation studies were continued in the anthracite region throughout the year, and two papers—one on the Glen Alden Coal Co. mines and the other on the Hudson Coal Co. mines—were completed. Many other mines in this field were visited, and much additional information was obtained. The ventilation problem in the anthracite mines is complicated, and where ventilation is not studied and planned systematically much power is wasted in the attempt to deliver fresh air to all the working places; moreover, the cost is excessive.

Conclusions.—The dissemination and analysis of technical data from all the principal mining districts in information circulars have been valuable services, particularly to large mine operators. Further field studies are necessary to complete manuscripts on the open-pit mining method, core-drilling methods and costs, methods and costs of mining iron ores, hoisting practice, mine drainage, and on a number of milling problems. For the present, however, efforts are to be continued to extend all possible service to the small mine operators.

METALLURGICAL DIVISION

New processes.—Four new processes have been carried to the stage of development where they are ready for industrial application. These are the natural-gas smelting of zinc ore and of iron ore, the explosion shattering of ore as a substitute for grinding, and the alternating-current magnetic separation of minerals. All of these processes, together with the related theoretical work, have been described briefly in a series of progress reports.

Metallurgical fundamentals.—The collation of existing data on high-temperature specific heats has been completed and published as Bulletin 371, Contributions to the Data on Theoretical Metallurgy: II, High-Temperature Specific-Heat Equations for Inorganic Substances.

The data on vapor pressures have also been compiled and prepared for publication.

Experimental work is under way on the thermodynamic constants of chromium compounds.

Metallurgy of copper.—In the field of copper metallurgy reduction in the staff has necessitated restricting investigations to a study of the

flash roasting of concentrates. One paper giving the results of this research was published during the year.

Metallurgy of lead and zinc.—The work on handling zinciferous charges in the lead blast furnace, which has been under way for the past 2 years, was completed and prepared for printing. Publication has been delayed for lack of funds.

Metallurgy of gold.—Methods for the recovery of gold have continued to have a great public interest, and the division has devoted considerable time to the study of methods for treating refractory ores.

Metallurgy of iron and steel.—Activities in the field of direct iron and steel have included a survey of iron-ore resources with respect to amenability to rigorous concentration, development of a new method for reducing iron ore by natural gas, direct production of wrought iron from ore and from sponge iron, and a comparison of the properties of total steel made from scrap and from sponge iron. Studies on the most efficient operation of the iron blast furnace have included research on the relative reducibility of natural ores, sinters, and briquets, as well as on the role of manganese in the desulphurization of pig iron.

Ore dressing.—Work on power consumption in ball milling has been continued, and the list of nonsulphide minerals which can be recovered by soap flotation increased substantially.

Special studies.—Investigations of the magnetic properties of minerals have progressed steadily; and in February the development of a new type of magnetic separator was announced in which separation was accomplished by repulsion, rather than attraction, of the magnetic mineral. Methods of using this separator have been described for the following ores: Chromite, ilmenite, hematite, magnetite, ferberite, heterogenite, pyrite, limonite, and pyrrhotite.

In the field of explosion shattering, perfecting a satisfactory valve for continuous operation has permitted actual cost studies of steam consumption to be made; it has been found possible to reduce the cost of steam to less than 5 cents per ton of —48-mesh dolomite produced from ½- to ¾-inch material with the laboratory machine. All indications are that a commercial machine will be much more economical in steam consumption.

Conclusions.—The results obtained during the year have demonstrated the value of fundamental studies of metallurgical processes in improving their usefulness and in developing new ones. The greatest need of the division is for supplies and personnel to expand these fundamental studies and develop new metallurgical procedure that will result therefrom.

PETROLEUM AND NATURAL-GAS DIVISION

Cooperative investigations.—The practical value of the Bureau's engineering studies in oil and gas fields, many of which are conducted

in cooperation with various States, associations, and other agencies, continued to be demonstrated during the year. The following typical requests for cooperative help are of interest.

(1) The Michigan Department of Conservation requested and received assistance in determining the economic value of the natural-gas reserves in that State.

(2) Gas operators in the Texas Panhandle requested a technical study of the practicability of returning natural gas, stripped of its gasoline content, to the producing formations. Enormous volumes of this gas are now wasted. An important element of the problem is whether the relations governing the flow of natural gas from the producing formations to the surface, discovered by Bureau engineers, apply also to gas injection.

(3) The Kansas State Board of Health sought assistance in devising a method for disposing of oil-field brines. The gravity of the problem is indicated by estimates that in one field 400 tons of chloride salts, a hazard to fresh-water supplies, are produced daily as brine.

(4) In cooperation with operators the Bureau studied the flow of wells and reservoir conditions in east Texas and Oklahoma fields. This work supplied data of a type not previously available, which have been used to improve operating practices and to conserve resources.

Production of oil and gas.—Continuing work on subsurface relations of oil and gas evolved better methods of determining the energy available from expansion of gas from natural-reservoir crude oil, augmenting findings reported in a paper on the solubility and liberation of gas from natural oil-gas solutions. Improved technic which will minimize waste should result from this information.

A preliminary report was published dealing with a laboratory investigation of the oxidation of crude oils by air used to stimulate production. In the experiments paraffin-base oil was affected less seriously by oxidation than naphthene- and intermediate-base oils.

The Bureau's methods of gaging and controlling gas wells, including wells treated with acid, were applied extensively, and a comprehensive report was prepared. A technical paper was issued describing a convenient method for measuring the viscosity of natural gases that is adequate for practical application.

Natural-gas transportation.—A report was published giving simplified formulas, curves, and charts to facilitate economical design of parallel pipe lines, which will prove especially useful where existing natural-gas transportation systems are to be augmented. Moreover, initial studies were made of solids, thought to be hydrocarbon hydrates, that form in natural-gas pipe lines.

Engineering field studies.—Water encroachment, remedial measures, and other producing-horizon problems were studied in Permian Basin fields of Texas and in the Oklahoma City field. A report soon

to be issued describes equipment used in the Oklahoma City area, the proving ground for improved and recently developed oil-field machinery. An engineering report was completed dealing with subsurface conditions in the Zwolle (La.) field and the use of acid in that area to stimulate production. The widespread treatment of wells with acid makes this report timely.

Special engineering problems.—Removal of mud sheaths from oil-sand faces is important, especially where formation pressures are low; otherwise, quantities of oil are trapped. A recent Bureau report describes a chemical method for removing mud sheaths by adding powdered limestone to the drilling mud. Later inhibited hydrochloric acid acts upon the calcium carbonate. The method is being applied in the field.

Two papers on evaporation losses were completed. One deals with the handling and transportation of petroleum and gasoline, the other with bulk-storage stations.

Data were given to the gas industry in a Bureau report on the corrosion of steel by gases containing traces of hydrogen sulphide, with particular reference to effects of pressure and moisture, representing the first authentic information on a type of corrosion that if uncontrolled may necessitate large expenditures for replacement of equipment. A companion paper deals with the comparative resistance of certain commercial ferrous materials to gaseous hydrogen sulphide corrosion.

Chemistry and refining.—The removal of free sulphur from gasoline by lime and hydrogen sulphide was discussed in a report published in the technical press; another paper, describing a continuous laboratory topping apparatus developed in the Bartlesville Laboratory, was presented before a scientific society. Reports giving tabulated analytical data on all crude oils from Texas heretofore analyzed by the Bureau of Mines (298 samples) and detailed analyses of crude oils of the Louisiana Gulf coast area were submitted for publication. Curtailed funds prevented surveys of the characteristics of gasoline sold to the general public.

Helium section.—The Amarillo helium plant produced 6,534,270 cubic feet of helium for use by the Army and Navy in airships. The purity of the plant's output was better than 98.2 percent and recovery about 90 percent. Acquirement of the Cliffside reserve was completed, giving the Government control in fee of more than 50,000 acres, covering a closed geologic structure containing helium-bearing natural gas. The rock pressures of the wells indicate a depletion of only 2 percent of the gas reserve after producing 58,000,000 cubic feet of helium in 5 years of operation. Thus the Nation is assured a supply of helium for many years.

The Cryogenic Laboratory, formally opened by Mme. Marie Curie on May 21, 1921, continued research on the conservation, production, and purification of helium and other industrial gases. Several reports were published for the benefit of the industry. Such investigations have been important in reducing the cost of helium to a point thought impossible a few years ago. Although curtailed demand reduced the plant's output to less than half that of former years, total expenditures in plant and gas-field operation were less than \$10.25 per thousand cubic feet of helium produced, and the Government's net operating cost, taking account of returns to the Treasury from the sale of residue gas, was only about \$7.50 per thousand. Before the Amarillo plant was built helium cost \$34 or more per thousand feet.

On recommendation of the Secretary of the Interior, the President set aside Helium Reserve No. 2 on public land in Utah. This reserve, although small, contains gas of high helium content and will be held for a national emergency.

Conclusions.—The Bureau's work on oil and gas has been crippled seriously. Curtailed appropriations caused termination of studies that had reached a point where definite results of practical value were assured. There is need for investigations of fluid-energy relations pertaining to optimum well spacing, performance of wells under controlled production, water encroachment, and economical withdrawal of oil and gas. Research into fractional distillation should be expanded to include methods of obtaining petroleum products without excessive refining costs.

Further unification and centralization of all production and refining studies will be made to place collected data in a form usable by industry. Construction of an engineering laboratory at the Petroleum Experiment Station, Bartlesville, Okla., would remove the handicaps of inadequate equipment and improper working conditions.

Funds should be supplied to drill 2 new wells and repair 3 wells on the Cliffside structure to protect the helium reserve from waste and assure an uninterrupted supply of gas. The helium-investigations appropriation should be restored, permitting necessary Cryogenic Laboratory studies and helium-bearing gas surveys to continue and thereby reduce operating costs and strengthen the national defense.

EXPERIMENT-STATIONS DIVISION

The Experiment-Stations Division has administrative control over and coordinates the work of the 11 experiment stations at which most of the technologic studies of the Bureau are conducted. In addition, the chief engineer of the division has technical supervision over the Bureau's research on nonmetallic minerals, coal preparation, coal chemistry, gas chemistry, and physical chemistry.

Nonmetallic minerals.—The most significant accomplishment in nonmetallic minerals research for the year has been the successful mechanical separation of sylvite (KCl) and halite (NaCl), hitherto regarded as impossible because of the close similarity in properties of these salts. In addition, the program of research to develop methods for extraction of potassium salts from polyhalite was virtually completed. The possibility of substituting domestic chalk and powdered limestone for imported products in the whiting industry has been proved.

Concentration of potash ores.—Starting with a sylvinite ore containing about 40 percent potassium chloride, the Mississippi Valley Experiment Station of the Bureau of Mines (at the Missouri School of Mines and Metallurgy, Rolla, Mo.), by classification and tabling or by jigging in brine solutions has recovered a product containing almost 88 percent potassium chloride. The mechanical separation of halite from sylvite, heretofore regarded as impossible, should provide a low-cost treatment process.

Recovery of potassium salts from polyhalite.—High recoveries and concentrations of potassium sulphate were obtained on a chemical engineering scale at the nonmetallic minerals experiment station, New Brunswick, N.J., in the continuous hot extraction of calcined polyhalite, a step essential to several processes. A new process for simultaneous utilization of polyhalite and sylvinite to produce potassium sulphate, a fertilizer ingredient now imported, was developed and tested on a laboratory scale.

Retarders for Portland cement.—Research at New Brunswick has shown that calcium hydroxide delays the hydration and set of tricalcium aluminate and retards the set of Portland cement. The retarding action is due to the formation of stable and insoluble hydrated tetracalcium aluminate at the surface of tricalcium aluminate and hindrance by the tetracalcium compound of metastable direct hydration of the aluminate to the tricalcium hydrate. Tricalcium silicate hydrolyzes with moderate rapidity to give calcium hydroxide. The retarding action of gypsum and other calcium compounds is due to formation of active calcium hydroxide.

Solubility of sodium sulphate.—The solubility relations of sodium sulphate in solutions containing a number of other sodium compounds have been determined at elevated temperatures at New Brunswick. These data are important in conditioning boiler water to prevent formation of scale and corrosion and in the recovery of sodium sulphate from natural or artificial brines.

Studies of whiting and chalk.—A study at the Northwest Experiment Station of the Bureau of Mines, Seattle, Wash., in cooperation with the State university, has shown that domestic chalks and powdered limestones can be used satisfactorily in putty, ceramics, rubber,

linoleum, and paints. The color of chalk was not improved appreciably, except by chemical precipitation.

Coal washing.—At Seattle comparison of flotation by mechanical agitation with the Elmore vacuum process under test conditions showed similar cleaning efficiencies, but less reagent and power were required by the vacuum process than by the agitation method.

As a result of Bureau of Mines studies at its Southern Experiment Station, Tuscaloosa, Ala. (in cooperation with the University of Alabama), on the washability of the Mary Lee coal bed, a plant erected by one company produced coal containing 8 percent ash, the lowest thus far produced commercially from this bed. Washability studies of fine slack coal from the Thompson and Woodstock beds were completed.

CHEMICAL AND PHYSICAL PROPERTIES OF COAL

Grindability of coal.—Due to the importance of powdered coal as an industrial fuel, a standard test that will measure the relative ease or difficulty with which various coals may be pulverized is an imperative need of the industry. The Northwest Experiment Station has studied the several methods already proposed for measuring grindability and has developed a test the Bureau believes to be superior to any other so far proposed.

GAS RESEARCH

Analyses of mine gases.—The Pittsburgh Experiment Station analyzed 1,222 gas samples, taken in mines and tunnels, for determining the cause of mine explosions, studying the extinguishing of mine fires, and improving ventilation in working places.

Warning agents for propane gases.—Materials were investigated that might prove suitable for imparting to propane, a comparatively odorless product of natural gases, properties making it perceptible to the senses to apprise persons of leakages that might create explosive hazards. The two most satisfactory substances found were ethyl mercaptan and refinery propane-propylene mixtures.

Inflammability of gases and vapors.—It was discovered that 50 to 70 parts by liquid volume of carbon tetrachloride rendered such materials as pentane, hexane, heptane, octane, gasoline, and solvent naphtha incapable of producing inflammable vapor-air mixtures. The inflammable limits of vapors of propylene dichloride, dioxan, and divinyl ether were determined. Studies of the causes of and remedies for underground explosions in manholes and sewers in Boston, Mass., have aided in decreasing the number of explosions and the attendant hazards to property and life.

Devices for respiratory protection.—A schedule of material and performance requirements for safe filter-type dust respirators has been

prepared. New approvals granted during the year include a mask for protection against hydrocyanic acid gas, a speaking diaphragm face-piece, and many extensions of approval to changes and improvements in hose masks.

Conclusions.—The foregoing accomplishments in nonmetallics research were achieved by a staff of 11 technical employees—6 at New Brunswick, 2 at Seattle, and 3 at Tuscaloosa—plus the part-time services of 2 men at Rolla for 3 months. The gas research was conducted by nine men. Considering the small staff, the output is large and represents a big return on the investment. Gravity methods have been applied successfully to the preparation of sylvite from its ore. Coal-cleaning research has led to the building of a new plant that produces the lowest-ash coal the particular bed has ever yielded. Contributions have been made to the treatment of fine coal. Domestic substitutes for imported whittings have been found. All will mean increased financial return for the domestic mineral industry.

Chemical agents to indicate the leakage of bottled gases have been developed. The inflammable limits of 3 vapors and the effect of carbon tetrachloride in inhibiting the inflammable properties of gases and vapors of 6 chemicals have been determined. Gas masks have been approved as to permissibility. A schedule was developed preparatory to undertaking similar approval of dust respirators. These activities have added to the safety with which workers in the industry may be employed and with which mineral products can be used.

If such significant progress can be made under the handicaps of the past year, it is obvious that still greater accomplishments can be expected if former appropriations are restored. In the field of non-metallic minerals investigations the extension of research on the chemical and physical properties of fine particles in relation to their solution, dispersion, coagulation, and settling in various media is urgently needed (*a*) to reduce pollution of air by fly ash from power plants burning powdered coal, (*b*) to prevent stream pollution from coal-washery wastes, and (*c*) to collect finely divided minerals from slimes in metallurgical plants.

In gas research the fundamental investigations on ignition and propagation of gas explosions should be extended, since the results to be obtained have such wide applicability to safety. The origin and evolution of combustible and irrespirable gases in mines and tunnels, the relative hazards in underground use of various fuels for internal-combustion engines, the prevention and removal of dust, air conditioning, gas diffusion, and extinguishing of underground fires should be given intensive study.

EXPLOSIVES DIVISION

Permissible explosives.—The work of the Explosives Division was restricted to tests, in connection with the list of permissible explosives, which are promised as a service to industry in published schedules.

Summary.—All study of explosions and all research work in explosives was recessed. The division was operated without an explosives specialist as division chief. Forty-nine reports and 224 analyses were made and 8 articles published. The explosives work of the Bureau was at the lowest ebb in its history.

OFFICE OF CHIEF MINING ENGINEER

Experimental mine investigations.—At the request of the Leasing Division of the United States Geological Survey, tests were made of the compressibility and bearing strength of large specimens of potash salt taken from the mine of the United States Potash Co. at Carlsbad, N.Mex., operating under lease from the Government. These data are to furnish a basis for estimating the size of pillars required to support the mine roof. It was found that under load the salt acts as a plastic material, and time studies of compression were required. Tests of four specimens indicated that the mineral would support a load of 3,000 pounds per square inch indefinitely but would fail slowly at 4,000 pounds. Funds allotted for the fiscal year were insufficient to continue tests of the explosibility of coal dust, except for a few demonstrations for groups of mining men. The work was suspended at midyear to permit a threatening mine fire on adjacent property to be extinguished and repairs within and without the Experimental mine to proceed; both projects were made possible by allotment from the Civil Works and Public Works Administrations and occupied the balance of the year.

Laboratory dust-inflammability investigations.—Work of this type was limited, but test determinations of dust from airways of the Holland Tunnels between New York and New Jersey disclosed that it was highly inflammable and should be removed or treated.

Mine Safety Board.—The board held 18 formal meetings to consider questions submitted to it by the Director of the Bureau of Mines and to formulate more safety decisions. A summary of 25 approved decisions, with explanatory text, was prepared and published.

International cooperation on interchange of information on mine safety.—Cooperation with foreign government bureaus corresponding to the Bureau of Mines continued to function by the interchange of quarterly reports and correspondence on specific technical questions with the official testing stations of Belgium, France, Germany, and Great Britain. A report prepared by a member of the British Safety in Mines Research Board on work carried on during his year's detail at Pittsburgh, concerning further development of standard

laboratory methods for dust-inflammability testing, will be published by the Bureau.

Consulting duties.—The consulting duties of the chief mining engineer involved preparation of reports for the Director and division chiefs on questions of safety and special details; for example, at the request of operators a field investigation of "bumps" in coal mines in the Cumberland Mountains of Kentucky and Virginia was conducted.

Conclusions.—The results of the investigations have already led to saving thousands of miners from explosions of gas and dust. To continue the work adequately requires additional allotments.

ECONOMICS BRANCH

COAL DIVISION

Service to coal industry.—The Coal Division maintains an information service for producers, distributors, and consumers of coal which includes a series of current reports that follow the short-time movements of supply and demand and detailed annual reports that provide a background for the prompt, current service and trace the underlying economic changes in the industry.

A total of 31,550 individual services was rendered during the year by mail, telephone, or personal interview. This does not include distribution of regular publications to established mailing lists.

Speeding up of work.—The outstanding achievement of the year was the speeding up of the work and releasing the final annual figures much earlier than in previous years. The annual chapter on Coke in 1931 was delivered to the editor on January 5, 1933, Coke in 1932 on October 31, 1933, and Coke in 1933 on May 18, 1934. The annual chapter on Coal in 1931 was received from the printer on December 30, 1932 and Coal in 1932 on October 31, 1933. The final annual figures for 1932 were mimeographed and released to the public in advance of being delivered to the editor for publication, as has been the custom in the past. These mimeographed reports for 1932 were distributed much earlier than in previous years.

Special effort was made to release the reports earlier to comply with many requests from the N.R.A. During the past year the Coal Division prepared some 50 special tabulations for use of the N.R.A., in addition to furnishing all of the available published material on the coal and coke industries. The district code authorities also made many requests for information during the past year.

Economies in publication.—The policy of collecting statistical reports through trade agencies, which was expanded in the previous year to reduce costs, was continued in 1933-34. The cooperative arrangement with the National Association of Purchasing Agents for the col-

lection of current reports on coal stocks and consumption has proved to be very satisfactory and has been continued.

Large savings were made in publication costs by combining existing reports and condensing tables to make more efficient use of available space. Editions were reduced, and the cooperation of the national coal-trade associations in reprinting extra copies was obtained.

Special investigations.—Results of special investigations published during the year include a study of the movement of coal by truck. The record of advancement of mechanized mining in the anthracite industry was followed with care.

Effect of economy program.—Reduction in personnel at the beginning of the fiscal year resulting from the impounding of appropriated funds in connection with the economy program threatened the maintenance of a number of the division's statistical series, including current reports on coal stocks, consumption, and distribution and production by fields. Through the release of a portion of these funds by the Bureau of the Budget to enable the Bureau of Mines to preserve certain essential statistical services the division was able to continue publication of the reports named.

Conclusions.—Passage of the National Industrial Recovery Act taxed the facilities of the division to the limit to furnish data on the coal and coke industries. In addition to supplying information to the bituminous-coal code authority, the division has answered many requests for information from the Reconstruction Finance Corporation, the Public Works Administration, the Division of Subsistence Homesteads, the Federal Emergency Relief Administration, and the Tennessee Valley Authority. In all such work the division service is limited to finding and certifying the facts that may be established by the statistical record or derived immediately therefrom. Departure from its role as a fact-finding agency conducted in a spirit of independent scientific inquiry would impair public confidence in its findings.

Even though there is a large fund of information available in the Coal Division, it frequently happens that the division is unable to supply the data desired by the many newly established Government agencies. For illustration, the bituminous-coal code authority is in serious need of current data on production by code authority districts and current data on destination of shipments of coal by code authority districts. With additional funds and personnel the division could supply the code authority with this information.

Among the immediate needs to increase the efficiency of the service rendered by the division are provision for resumption of printing of such analytical tables and diagrams of the annual reports on coal, coke, and byproducts as it has been necessary to drop since 1930; for payment of the 20-percent surcharge for rapid service at the Government Printing Office to avoid present delays in the publication

of the division's annual reports; and for printing manuscripts on coal distribution, marketing, partings in coal seams and their effect on costs, and similar economic studies. The publication of many additional current data on supply and demand, competition of substitute fuels, etc., which should be made available to industry, would be possible also if additional funds were provided. The provision of funds for field trips to collect information for annual and other reports and to keep abreast of developments also would materially enhance the value of the division's service to industry and the public.

The following basic information of national scope is greatly needed by both producers and consumers of coal, in their mutual interest:

1. Annual detailed surveys of the distribution of coal from each producing to each consuming market. This information, collected in 1929, proved extremely useful and is now urgently needed to show changes under altered conditions in the industry.

2. Annual statistics of the domestic fuel market, involving the equivalent of 160,000,000 tons of coal, would assist the coal industry to hold its proper share of this market.

3. Current information on changes in production capacity would afford industry a guide to the probable effect of such changes on market conditions and possibly discourage unnecessary or unwise expansion.

4. Economics of byproduct recovery; studies of supply and present and potential demand for the many byproducts of coal processing.

MINERAL-STATISTICS DIVISION

Minerals Yearbook.—Publication of the new Minerals Yearbook 1932-33 early in September 1933 marked the greatest advance toward the early release of annual statistical and economic information on minerals achieved in more than a half century of Government effort in this field. The Minerals Yearbook 1932-33, comprising 61 chapters covering the principal metals, mineral fuels, and nonmetals, was issued relatively soon after the close of the year it covered and represented a gain of many months over the tardy appearance of previous annual volumes. The early availability of reliable annual statistics of minerals was particularly important in 1933 in connection with difficult economic problems affecting the mineral industries, because of the need for up-to-date information in code negotiations under the National Recovery Administration, and as a source of data required by various Government agencies concerned with emergency projects.

The manuscript for the Minerals Yearbook 1934, comprising 72 chapters, was submitted to the printer on June 15, 1934. This second volume of the Minerals Yearbook series includes many improvements that will enhance its reference value.

In addition to preparing about 60 chapters for the Minerals Yearbook, the division compiles statistics on world production of mineral commodities and cooperates with State geologists and mine inspectors in statistical studies. Field offices maintained at Denver, Colo., Salt Lake City, Utah, San Francisco, Calif., and Joplin, Mo., collect data and supply direct service to the mining industry. They also prepare for publication 14 annual reports covering metal mining in all important producing areas.

Current reports.—Data gathered in over 100 annual statistical surveys of metals and nonmetals are released in mimeographed form before the Yearbook is published. Monthly reports on cement production, shipments, stocks, foreign trade, and other related data are compiled regularly. Similar reports on the gypsum industry are issued quarterly. The reports of this division comprise the only information available on production and marketing problems of many mineral commodities.

Conclusions.—The services of the division were required frequently during the year to provide information both to mineral producers and to Federal agencies concerned with the economic problems resulting from the depression. In some instances specialists of the division were loaned to the newer Government agencies. The statistics and information maintained by the division are the sole source of reliable official data for a large portion of the mineral industry.

Experience during the past year has shown that current statistical services should be inaugurated for many minerals, especially those utilized in the construction industry, and that additional information should be obtained in the annual canvasses to meet the demands of both industry and Government. This needed information can be made available by a moderate increase in the professional and clerical staff of the division.

PETROLEUM-ECONOMICS DIVISION

The work of the Petroleum-Economics Division during the fiscal year ended June 30, 1934 may be divided into two parts—the regular work done before August 19, 1933, the date on which the President signed the Petroleum Code, and the enlarged duties thereafter.

Routine and special work.—The present statistical reports of the division are the outgrowth of years of effort by specialists in the Bureau of Mines (since 1918) and the Geological Survey (prior to 1925). They are the official Government statistics on the petroleum industry; hence it was logical that when the Department of the Interior was named the Federal agency to administer the provisions of the code, the reports of the Bureau of Mines should supply the statistical background so important to any program of regulation. Where additional data were needed, as with interstate movements

and stocks of crude, arrangements were made whereby the necessary information was collected by the Bureau of Mines, with the assistance of certain Petroleum Administrative Board employees detailed for the purpose. Under this arrangement a series of monthly reports was initiated showing a break-down by States of crude runs to stills, crude stocks at refineries, interstate shipments of crude, and movements by the three common methods of transportation—pipe lines, tankers, and tank cars. This new report has supplied the basic data for consumer demand that are necessary to allocate the total allowable production equitably among the various producing States.

The new questionnaire for reporting crude-oil stocks in detailed form, which was prepared in cooperation with the Petroleum Administrative Board and the Planning and Coordination Committee, has been the basis of a new table showing stocks by location by States, which was included in the Monthly Petroleum Statement, beginning with August 1933. This new questionnaire stipulated that companies holding 100,000 barrels or over should make weekly reports of crude stocks by districts. These data, which cover about 98 percent of the total stocks, have been compiled by the Bureau of Mines and published by the Department every week since October 7. When used in conjunction with the weekly reports of production and crude runs to stills compiled by the American Petroleum Institute, they give a reasonably accurate picture of the current statistical position of the industry.

Annual reports.—The demands on the time of the division by the new Federal agency have necessarily been reflected in a slowing-down of the work on the annual and special reports of the division. The annual reports include chapters for the Minerals Yearbook on crude petroleum and petroleum products, natural gas, natural gasoline, carbon black, and asphalt and related bitumens. The special reports cover important phases of the industry, such as growth in refinery capacities, trends in refinery fuel consumption, sales of liquefied petroleum gases, and growth of pipe-line mileage and storage capacities. In spite of the additional work these reports, with one or two exceptions, are being prepared as usual, thus fulfilling the Bureau's obligation to maintain the basic statistics of the industry as in an unbroken series.

Conclusions.—The method used in computing the crude-oil allowables for August 1934 was revised from that previously used to provide for enough fuel-oil production to meet reasonable consumer demands. This fact alone justifies the recommendation that the Bureau be encouraged to obtain data on fuel-oil distribution similar to those compiled from 1926 to 1931. Further recommendations are that the division be given the authority and funds to compile data on natural-gas wastage and oil reserves.

RARE-METALS AND NONMETALS DIVISION

Summary of work.—Individual market and economic studies on more than 125 different mineral commodities are now available in publications prepared by the Rare-Metals and Nonmetals Division, and facilities for effective assistance to buyers and sellers of minerals have been created and maintained. Most of the commercially important commodities in the division's diversified field of activity have now been covered, and although general informational summaries on sundry other minerals and metals remain to be done this basic program has proceeded far enough to afford a foundation for intensive studies of individual industries and industrial groups and of their broader economic implications.

During the fiscal year a 60-percent reduction of the active personnel resulted in abandonment of minor objectives; but, notwithstanding the necessity of maintaining routine services and responding to specific inquiries for market and technical data, the division prepared 25 reports for publication by the Bureau and 25 articles for the technical press (exclusive of reprints and digests of Bureau publications). In addition, at the end of the year 15 reports were ready for Bureau publication and 1 article for outside publication. The division also supplied data to many authors of Minerals Yearbook chapters on rare metals and nonmetallic minerals that were not prepared by the division.

Advance estimates of domestic production.—Supplementing the annual production canvasses, which are rarely completed until several months after the close of the calendar year, and to assist those desiring to make long-term forecasts, the division has endeavored to develop a technique for estimating domestic production and other trade data from available barometers. Interim forecasts on such diversified items as barite, china clay, fire clay, phosphate rock, crushed stone, and sand and gravel and quarterly statements on gypsum consumption, by methods originated in this division, can now be made. With respect to phosphate rock, the estimate for 1933, which was available 3 months ahead of the final figures, was in error by only 1.75 percent. Intensive market studies on long-term trade trends in the lime industry and in the roofing-slate industry were completed during the fiscal year.

Summary study of volume and price data.—The tabulation and preliminary presentation of the basic factual data on the nonmetallic mineral industries have been completed in the form of a summary study of volume and price data. General indexes of productive activity and consumption, as well as prices in allied and barometric industries, are therein presented in parallel form to facilitate economic planning in connection with this group of industries, which hitherto

has escaped the attention of academic economic commentators. This report supplements an introductory report entitled "Economic Notes on the Nonmetallic Mineral Industries" and an information circular containing summary tables of the value of production of all nonmetallic minerals other than fuels and including thumbnail sketches of individual industries.

Conclusions.—During the last 5 years the division has built up a well-correlated mass of information and statistics on virtually all the rare metals and nonmetallic minerals. Meanwhile a technique for market analysis and economic service has been developed to assist in summarizing and marshaling these data into reports. For the near term the activities of the division will be restricted mainly to maintaining its status as the principal repository of information on the commodities in its field in responding to current inquiries from those seeking economic and technical information. Notwithstanding the fact that the momentum of previous activities has been largely dissipated, the essential factors for economic planning by industry and the Government are being maintained and facilities for effectively utilizing these stores of information may be speedily reconstructed. With fortified personnel the building-materials section, in particular, is prepared to take an active part in any program in connection with the upbuilding of the capital goods industries.

COMMON-METALS DIVISION

The mineral commodities in the field of this division are gold, silver, copper, lead, zinc, aluminum, tin, nickel, iron, manganese, chrome, sulphur, and pyrite. Economic aspects of most of these commodities assumed wide-spread national interest during the past year, and demands upon the division for statistical and other information regarding them increased accordingly.

Service work.—The changes in the value of the dollar and the fixing of the price of newly mined silver inspired studies on the status of the monetary metals, not only by the Treasury but by Members of Congress, banking and commercial interests, economists, and others. A large volume of inquiry on these metals was answered by this division or assisted by studies undertaken by the division. A paper was published concerning the effect of 64.64-cent silver upon the value of ores of base metals. Another was written upon the origin of the monetary use of metals.

Preparation of the codes of metal industries by the National Industrial Recovery Administration was guided largely by consideration of fundamental data concerning the several metals. The division pro-

vided various compilations required for this purpose; its specialists attended many code hearings and served at times as advisors to the deputy administrators concerned. Special services were rendered several other Government agencies, including the Federal Trade Commission.

Special studies.—Studies were conducted upon the following subjects, among others: Facilities, plant capacity, and ownership applying to the production of synthetic cryolite and fluorides; the power requirements for mining in the tri-State and southeastern Missouri mining districts; the cost of sulphur production; reserves of bauxite ore; sources of domestic silver with respect to various kinds of ores; the effect of relative price levels for lead and zinc upon the use of pigments made from them; the effect of low-cost copper upon domestic industry; the economic background of tin smelting in the United States; the use of ammonia-free zinc scrap for making zinc chloride; and the raw materials of sulphuric acid manufacture.

Conclusions.—The division also produced its usual quota of chapters for the Minerals Yearbook and of other routine papers and reports. On the whole, it met demands for service by the public and by other Government agencies more adequately than might have been expected in view of the severe curtailment of its personnel and the loss of time caused by moving twice during the year.

PRINCIPAL MINERAL TECHNOLOGIST

The principal mineral technologist handles specimens referred to the Bureau of Mines for determination, writes chapters entitled, "Molybdenum", "Tungsten", and "Radium, Uranium, and Vanadium" for the Minerals Yearbook, and makes special effort to keep abreast of the knowledge on these subjects. Work on commercial gases other than helium and those used for fuel has been begun. He is engaged in rewriting and enlarging A Glossary of Mining and Metallurgical Terms.

During the year more than 1,400 letters on 198 different subjects were written, 1,450 determinations of minerals were made, and more than 600 people called personally to consult about mineralogical and mining subjects. Letters were received from every State, Alaska, Puerto Rico, Hawaii, the Philippines, and 18 foreign countries.

Lectures on mining and mineralogical subjects were delivered in New York, Philadelphia, and Spruce Pine, N.C.

Little knowledge concerning the production, quantities, and uses of gases other than those used for fuel has been published, and such information is being gathered for publication in the Minerals Yearbook.

HEALTH AND SAFETY BRANCH

SAFETY DIVISION

Safety records of 1931, 1932, and 1933.—The calendar year 1931 established a record low rate of mine-accident occurrence in both coal and metal mining, 1932's rate was almost as favorable, and 1933 had by all odds the best or lowest accident rate in the history of coal mining, in spite of the fact that periods of financial depression, with a recession of activity in mining, have been accompanied almost invariably by sharp increases in mine-accident rates. During the fiscal year 1934 only one major disaster occurred—in September, with a loss of 7 lives; the annual record was by far the best in the history of the United States as regards avoidance of major coal-mine explosion disasters. For 11 months in the fiscal year 1934 as well as 11 months in 1933 no major explosion occurred in the coal mines of this country, the best records in the present century.

Various factors undoubtedly are responsible for these excellent safety records, but unquestionably the efforts of the United States Bureau of Mines to advance health and safety in mining are having a vital influence. During the past 7 years the Bureau has trained nearly 520,000 persons in the mining and allied industries in first aid or mine rescue; first-aid-trained men not only avoid accidents to themselves but help to prevent accidents to others.

Rock-dusting, long advocated by the Bureau to prevent wide-spread coal-mine explosions, is now preventing numerous such disasters and saving many lives annually.

In addition, largely as a result of various Bureau activities, many accidents from falls of roof, haulage, explosives, electricity, and other causes are now prevented; proof is offered in data from individual mines, mining companies, and other organizations, and State inspectors where cooperative safety activities have definitely reduced accidents from the various causes enumerated.

Safety training.—Among its varied activities during the fiscal year 1934 the Safety Division's total field personnel of 22 engineers and 23 safety instructors gave full first-aid or mine rescue courses to 56,728 persons in the mineral industries in 462 communities in 31 States, a decrease of approximately 24 percent from the previous year, or slightly less than the percentage of decrease in funds and personnel available for this work. To date the Bureau has given these courses of safety training to 812,378 persons; 455,970, or more than 56 percent, were trained in the last 5 years. It is believed that, as a result of this work, several hundred lives are saved annually by direct application of first aid and several thousand nonfatal accidents avoided by use of safer mining methods.

To June 30, 1934, certificates were issued to 1,148 mineral establishments indicating that all their employees had received the Bureau of Mines first-aid course. During the past fiscal year, 111 of these 100-percent certificates were issued, covering the training of 20,133 persons, or about 35.5 percent of the training done by the Bureau.

The accident-prevention course in bituminous-coal mining, for instructing bituminous-coal-mining officials in up-to-date accident-prevention methods, is so extensive that several weeks are required for presentation, and necessarily the classes are relatively small. In 1934 the full course was given to 529 mining officials, and nearly 600 others took part of it; 5,513 bituminous-coal-mining officials have taken the full course since it was instituted in the late fall of 1930.

In all, 550 first-aid instructors' certificates were issued during the year, bringing the total to 4,567 since this training was begun in 1930; these certificates are eagerly sought, as holders thereof are being given preference in employment by many agencies and industries.

Holmes Safety Association.—At the annual meeting, on March 5, 1934, of the Joseph A. Holmes Safety Association, an organization sponsored by the Bureau of Mines, 12 medals were awarded to individuals for deeds of heroism, and 70 certificates of merit were awarded for outstanding safety achievements in the mineral and allied industries. The recognition given meritorious safety effort in these industries through the Joseph A. Holmes Safety Association awards stimulates safety effort; scores of excellent safety records have been made by mining organizations during the past few years either through the attempt to obtain one of these awards or to equal or surpass the accomplishments on which past awards have been based. In fact, a dozen or more coal mines have been given awards for operating a year or more without one lost-time accident, which was deemed impossible a few years ago.

In the past year 32 community safety clubs were organized as Holmes Safety chapters, with a new membership of 6,707 persons. Approximately 200 chapters are now functioning actively, with a membership approximating 60,000. Safety Division field men made safety talks before about 200 Holmes chapter meetings during the year; the mimeographed Holmes Safety Chapter Notes were, however, discontinued due to the necessity of economizing under the radically reduced allotments available.

Aid at accidents.—The Safety Division personnel rendered assistance and had contacts of various kinds at explosions, fires, and other accidents in the mineral industries during the year as follows: 26 explosions in 6 States (28 persons killed and 55 injured); 18 fires in 8 States (6 persons killed and 3 injured); and 55 miscellaneous accidents in 13 States (52 persons killed and 93 injured).

Safety inspections.—Making safety inspections and reports on mines and other mineral plants continued to constitute a major activity of the Safety Division in promoting health and safety in mining. Division field men made 221 confidential reports based upon safety examinations or inspections of mining properties during the year; 61 were transmitted to operators for their confidential information, but no reports of this type are published.

Safety meetings.—Attendance at safety meetings and general participation in the proceedings or discussions are part of the duties of the personnel of the Safety Division; usually these meetings are held at night, after a full day in or around mines in forwarding some phase of the Bureau's safety work. In the fiscal year 1934 the field men of the Safety Division attended 612 safety meetings in 30 States, attended by about 107,000 persons in all. These meetings are in addition to those of a routine nature in giving first-aid or mine rescue training or the accident-prevention course; such courses are also given at night meetings.

Publications.—More than 50 reports relating to safety in mining were published during the year.

Conclusions.—The very heavy reduction of funds for the fiscal year 1934 not only forced dismissal of 13 engineers and field safety workers of the Safety Division, as well as 3 clerks and 2 cooks, but also so severely curtailed travel and supply funds for the 45 field men who remained that they were able to function with but limited efficiency. As one of the results of the diminished funds for the work in the fiscal years 1933 and 1934 it has been found necessary to abandon 8 of the 10 mine rescue cars temporarily, and the safety work of the Bureau is being handicapped very seriously thereby.

Although the accident rate of the mining industry was greatly improved in the calendar years 1931, 1932, and 1933, it still has by far the highest rate of the major industries in the United States as well as in the countries of the world where mining is done to any considerable extent. That there is no necessity for this is now proved by the fact that many individual mines or mining companies have been operating for at least a year during the past 5 or 6 years without accidents and in doing so have reduced not only the misery due to them but operating costs as well. The 20 or more years of effort by the Bureau of Mines have been rewarded by the reduction of mine-explosion disasters 90 or more percent in number and in fatalities. Indubitably, other types of mine accidents, such as those from falls of roof or of persons, haulage, explosives, and electricity, can also be reduced 75 to 90 percent if all mining people can be educated to the idea that such accidents can be avoided. The Federal Government, through its Bureau of Mines, is the agency by far the best-equipped to do this educational work, which has been put under way largely

n the past half decade. Results thereof have already been reflected in a virtual avoidance of major disasters during that period and in the lowest fatality rates in American coal-mining history during 1931, 1932, and 1933.

HEALTH DIVISION

Although the Health Division was recessed as of July 15, 1933 because of the severe curtailment of Bureau of Mines appropriations many health studies were made in and around mines during the past fiscal year, one of the most important being an investigation of illumination. Special work was done on numerous phases of the use of explosives in mines, on the dustiness of mine air and its effect on health, on conditions that cause various kinds of accidents in mines, on the various items that enter into the cost of accident occurrence in the mining industry, and on the use of protective clothing. Many of the papers published by the Safety Division referred to health in and around mines. There is now a much greater demand for investigations into health features of the mineral industries than in any other period of the Nation's history.

DEMOGRAPHICAL DIVISION

Through the collection and analysis of statistics known to be impartial, the Demographical Division supplies the factual basis needed for investigations of accidents in mines and quarries and of means for their prevention. Two outstanding facts were revealed by the work of the past year:

1. Minerals produced in the United States in the calendar year 1933 were, in general, obtained at a smaller loss in life and limb per ton.
2. A rapidly increasing number of companies are operating their properties not only without fatal accidents among their employees but also without a lost-time injury to any worker.

Bituminous-coal mines.—Although complete statistics for the calendar year 1933 are not yet available, partial information indicates a gratifying reduction in the accident-frequency rate per million man-hours of exposure to mining hazards and a more notable reduction in the frequency of accidents per million tons of coal produced. The industry employed more men, produced more coal, and worked a larger number of man-hours in 1933 than in 1932, judging from reports from a number of companies whose mines were in operation during both years. The reduction in the accident rates for 1933 was accompanied by a decrease in the production of coal per man-hour of work performed. Available information regarding the rates for the first 6 months of 1934, covering fatal accidents only, shows further progress, though slight, compared with the first half of 1933.

Anthracite mines.—Records now available indicate that the accident rate for anthracite mines, both on a man-hour-of-exposure basis and

on a tonnage basis, was lower and therefore better in 1933 than in 1932. Reports for identical mines operating in both years showed a larger number of men employed in 1933 but a smaller output of coal and a smaller number of man-hours worked.

Metal mines.—The accident rate for the metal-mining industry increased in 1933, although the number of men employed at the mines and the number of man-hours worked during the year were less than in 1932. The tonnage of material handled per man-hour was slightly larger in 1933.

Nonmetallic mines.—Mines producing nonmetallic minerals experienced a higher accident rate in 1933 than in 1932. Although fewer men were employed the number of man-hours of work increased, and the tonnage of material mined also increased.

Stone quarries, cement mills, etc.—With a larger number of employees but with fewer man-hours of employment or exposure to occupational risk, the stone-quarrying industry and such related activities as rock-dressing and the manufacture of cement and lime had a higher accident rate in 1933 than in 1932, according to reports from identical companies operating in both years.

Accident-prevention contest.—Definite evidence of increasing interest in accident prevention and of tangible benefits and savings that follow is furnished by the participation of 332 mines and quarries in the ninth national safety competition conducted by the division. Statistical analysis of the accident reports from the participating companies for the past year showed an increasing number of mines and quarries achieving perfect safety records, that is, conducting their operations without an accident causing loss of time to an employee. Particularly gratifying was the operation of six bituminous-coal mines, which are enrolled in the contest, without an accident. Information received from many of the companies indicates that national competition in accident-prevention effort is a potent means of promoting safety and of maintaining the interest of management and employees in safety throughout the year. Moreover, as the accident reports from the companies and the reports of man-hours of work performed are certificated by the companies as to completeness and accuracy, they constitute a source of reliable data indicating possible trends in technological and economic studies of the mineral industries, in addition to serving their immediate purpose—the prevention of accidents and maintenance of interest in safety.

Explosives.—Nearly 70 percent of all explosives used for industrial purposes in the United States are consumed by the mineral industries. The actual production of explosives in 1933 was 33,927,443 pounds of permissible explosives, 157,849,273 pounds of other high explosives, and 64,210,675 pounds of black blasting powder.

Conclusions.—Although excellent progress in reducing human and economic waste due to accidents is being made by many mining and quarrying companies, other large sections of the industry continue to operate under high accident rates. Intensive statistical research should be conducted to reveal more fully prevailing conditions in those sections of the mining industry in which progress in safety is slow or absent. The loss of 4 from an already undermanned force of 15 employees has seriously handicapped the division in conducting its work, which involves the collection, compilation, and analysis of reports from all mines and quarries in the United States. The most pressing need of the division is an adequate personnel trained in the science of statistics as applied to the mineral industries. The cost of such personnel would be infinitesimal compared with that of accidents which might be prevented by applying the results of appropriate statistical research.

ADMINISTRATIVE BRANCH

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, clerical assignment, and general administrative routine.

On July 1, 1933, there were 63 employees in the division, 31 of whom were terminated or transferred to other divisions during the fiscal year, due to reduction of force. This reduction of 49 percent in personnel, compared with an average of 33 percent for the Bureau as a whole, made it impossible to supply the usual prompt service to the other divisions. Some temporary help, mostly for the duplicating service, was hired late in the year to bring a large accumulation of work up to date. In the clerical service section, which during the 2 preceding fiscal years supplied a large amount of stenographic and clerical service to the entire Bureau, 8 of the 9 employees on duty July 1, 1933, were terminated or transferred, a loss of 89 percent. The loss of personnel in the other sections ranged from 36 percent in the accounts section to 48 percent in the multigraph and property section and 50 percent in the mails and files section.

The Division needs the following additional employees to function properly and provide the minimum of service needed by the present reduced Bureau personnel: 1 graphotype operator, 1 multigraph operator, 2 assistant messengers, 1 junior messenger, 1 file clerk, and 2 clerk-stenographers.

The curtailed personnel in the Office Administration Division, as well as in other divisions of the Bureau, has necessitated shifting the

duties of many employees who remained. In some instances these changes have increased the responsibilities of employees to such an extent as to warrant higher allocations; in others, although reallocations are needed, the grade would remain the same.

Personnel.—On June 30, 1934, there were 523 full-time appointed employees on duty at the Bureau, including 22 employees hired temporarily for job work; in addition, there were 3 full-time cooks who had been hired under field agreements. The appointed employees were distributed as shown in the following table:

	Classification and number of appointees				
	Profes- sional	Subprofes- sional ¹	C.A.F.	Custodial ²	Total
Washington.....	³ 38	4	131	7	180
Pittsburgh.....	⁴ 62	28	41	42	173
Field in general.....	⁵ 96	24	31	19	170
Total.....	⁶ 196	56	203	68	523

¹ Includes instrument makers, safety instructors, laboratory aids, assistants, etc.

² Includes motor-truck drivers, janitors, laborers, messengers, etc.

³ Engineers, 17; chemist, 1; miscellaneous, 20; total, 38.

⁴ Engineers, 30; chemists, 25; miscellaneous, 7; total, 62.

⁵ Engineers, 50; chemists, 24; miscellaneous, 22; total, 96.

⁶ Total, engineers, 97; chemists, 50; miscellaneous, 49; grand total, 196.

In addition to the foregoing full-time employees, the following persons were engaged on a "when-actually-employed" basis: 24 laborers, etc., employed on field agreements; 1 consulting mineralogist; and 60 other employees holding classified, unclassified, or excepted appointments on a part-time basis, making a total of 611 employees, a decrease of 280 employees compared with the number on duty on June 30, 1933.

Property.—The property records, as of June 30, 1934, show accounts as follows:

Automobiles and trucks.....	\$78,618.22
Canvas and leather goods.....	2,985.84
Drafting and engineering instruments.....	9,926.37
Electrical equipment.....	64,686.67
Hardware and tools.....	33,087.93
Household equipment.....	19,863.93
Laboratory apparatus.....	468,835.66
Medical equipment.....	8,355.61
Office furniture and equipment.....	290,692.21
Photographic apparatus.....	26,806.45
Machinery and power-plant equipment.....	1,004,805.54
Land, buildings, and improvements.....	1,364,945.97
Rescue cars and specialized apparatus.....	403,678.31
Total.....	3,777,288.71

This property is located in Washington and at the various field stations and offices of the Bureau.

The total given above indicates a decrease of \$959,341.63 under the figure for June 30, 1933, due principally to the transfer of the Government Fuel Yards to the Procurement Division of the Treasury Department.

INFORMATION DIVISION

The Information Division comprises five sections concerned with dissemination of information resulting from the various investigations of the Bureau.

Publications.—During the past year the publications section supervised the distribution of 107,600 copies of the free editions of the Bureau's printed publications and approximately 160,000 reports of investigations and information circulars. These were sent, however, only as the result of a direct request by the recipient either for a specific publication or for all publications on a particular subject.

In addition, about 100,000 copies of the Bureau's printed reports were sold by the Superintendent of Documents.

Numerous brief press statements, announcing the issuance of new publications or giving particulars in regard to current investigations, were furnished to the daily and technical press. These short items were widely printed and served effectively in acquainting the public promptly with the results of the Bureau's work.

The section answered more than 50,000 letters requesting publications or information regarding the Bureau's activities and general mining subjects.

Editorial.—During the past year 9 bulletins, 4 technical papers, 1 economic paper, 101 Mineral Resources and Minerals Yearbook separate chapters, and 6 miscellaneous papers—a total of 121 printed publications—were edited and sent to the printer. Owing to lack of printing funds, however, only part of the Bureau's output could be issued in this manner; consequently, 115 papers had to be published in the technical and trade press by technical societies, cooperating educational, State, and municipal institutions, or similar outside agencies.

The section also edited 44 reports of investigations and 73 information circulars. These are papers designed to supply promptly to the mining industry and the general public the essential results of the Bureau's investigations, which are usually described in detail in later printed reports, or to present salient facts on subjects of interest in a concise form suitable for use in reply to inquiries.

Motion-picture production.—As a means of disseminating information regarding safety and efficiency in the mineral industries, the Bureau maintains what is perhaps the largest library of educational

motion-picture films in the world. These films, prepared under the supervision of the Information Division and through the cooperation of industrial concerns which bear the entire cost of production, show where essential minerals are found and how they are extracted from the earth, manufactured or refined into useful everyday products, utilized, and conserved. The prevention of accidents and the protection of human life have been given special attention, and several pictures deal specifically with this important subject.

During the past year 7 film subjects were revised, and 578 additional reels were obtained for circulation.

Library.—The year's accessions to the library comprised 2,487 books and pamphlets; 300 periodicals were currently received; and 4,187 books were loaned for use outside the library.

Graphic section.—In addition to drafting and photographic service, the graphic section circulates the Bureau's motion-picture films. This work is centralized at the Pittsburgh Experiment Station, but there are 12 subdistribution centers throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but the exhibitor is asked to pay transportation charges. On June 30, 1934 the Bureau had 1,104 sets of films, including 1,242 reels, aggregating 1,730,000 feet. During the year the films were shown on 49,457 occasions before an estimated audience of 4,069,000 persons.

Conclusions.—The Information Division, as the outlet through which the results of the Bureau's scientific investigations are made available to the mining industry and to the general public, rendered valuable and efficient service during the year in editing more than 350 manuscripts, distributing a quarter of a million publications, revising and circulating educational motion-picture films, answering letters and inquiries, and preparing statements that were widely printed in the daily, trade, and technical press.

The full practical value of scientific investigations conducted by the Bureau obviously cannot be realized by the mining industry unless the results are made generally available in printed reports. The Bureau is greatly handicapped by lack of adequate printing funds. The allotment of \$104,800 in 1932 was cut to \$37,000 in 1934—less than that of any year since the first year of the Bureau's establishment. As a result it was possible to print only 9 bulletins and 4 technical papers in 1934 compared with 25 and 36 in 1932. It is highly important that the Bureau's printing funds be increased by at least 100 percent to permit printing the results of investigations and make them available to the industry.

DIVISION OF SUBSISTENCE HOMESTEADS AND FEDERAL SUBSISTENCE HOME- STEADS CORPORATION

(CHARLES E. PYNCHON, General Manager)

ESTABLISHMENT OF SUBSISTENCE HOMESTEADS PROGRAM

Authority for a subsistence homesteads program was established by Congress in section 208, title II, of the National Recovery Act, which empowered the President to designate an agency to make loans and otherwise aid in the purchase of subsistence homesteads. Congress voted an appropriation of \$25,000,000, with the specification that homesteaders' repayments should constitute a revolving fund.

The Subsistence Homesteads Division of the Department of the Interior was organized August 23, 1933, pursuant to an Executive order of July 21, 1933. The Federal Subsistence Homesteads Corporation was created by the Secretary of the Interior to act as the Division's operating agency.

The Division of Subsistence Homesteads operated during the first months of its existence under the direction of Dr. M. L. Wilson, who resigned as of June 30, 1934, to become Assistant Secretary of Agriculture. The Division is now under the direction of Charles E. Pynchon, general manager of the Federal Subsistence Homesteads Corporation. The first 10 months of the Division's existence have seen the subsistence homesteads program proceed through the earlier formative stages to a present stage where progress may be measured in acres under improvement, houses constructed, and families living in their new homes and working upon their homesteads.

PROGRESS TO DATE

The close of the first 10 months of the Division's existence finds 57 projects approved and allotted their portion of the \$25,000,000 fund. Of these projects, 40 have been publicly announced. An additional project, designed for rural rehabilitation in northern Wisconsin, has been transferred to other Government agencies which are undertaking this type of work.

Substantial advances have been made to 27 projects. As of June 30, 1934, allotments totaled \$16,533,970; advances and authorizations, \$2,121,355.79.

Land has been purchased for 25 projects. House construction has been started on 9 projects, and preliminary work is well under way on numerous others.

As an important corollary to its main function, the program of the Division, at the end of the fiscal year, was giving employment outside of the administrative and technical personnel to 1,851 persons, whose wages for work performed in June 1934, totaled \$106,010.93.

In the following section will be found a concise summary of each project.

PROJECT SUMMARY AND STATUS

Birmingham, Ala. (No. 1).—Allocation, \$750,000; number of homesteads, 300; acreage, 2,109. A workingman's garden project outside of Birmingham; complete project calls for 300 homesteads, estimated to cost \$2,500 each; project to begin with a 60 homestead unit. Surveys have been made; work on 60 wells under way; bids now being asked for construction of 60 houses in first unit.

Jasper-Putnam Counties, Ga. (No. 2).—Allocation, \$1,000,000; number of homesteads, 500; acreage, not yet determined. An experimental agricultural project furnishing an opportunity for tenants to become owners. Development to start with initial unit of 50 homesteads; 15,000 acres have been purchased; 8 houses built.

Pender County, N.C. (No. 3).—Allocation, \$1,000,000; number of homesteads, 300; acreage, 4,825. An experiment in rural rehabilitation. The first development is for 200 families. Personnel selected; 4,500 acres purchased; 325 additional acres to be purchased. One thousand acres cleared; half planted to crops. Ten houses being constructed by force account; additional house plans being prepared.

Decatur, Ind. (No. 4).—Allocation, \$125,000; number of homesteads, 48; acreage, 80. Homesteads costing approximately \$2,500 each will have 3-, 4-, or 5-room houses. Homesteaders will be selected from industries of Decatur. Land acquired; land planning completed; house plans approved and bids requested; water and street utilities constructed.

Hightstown, N.J. (No. 8).—Allocation, \$500,000; number of homesteads, 200; acreage, 1,197. Individual homesteads on 1 acre lots; settlers, unemployed or partially employed skilled Jewish needle workers. There will be a community owned dairy farm, truck farm, general store, and small clothing factory. Land acquired; project manager, engineer, and architect appointed.

Phoenix, Ariz. (No. 9).—Allocation, \$500,000; number of homesteads, 300; acreage, not yet determined. Complete project will have units scattered throughout the State. Units I and II, near Phoenix, provide for 49 homesteads. Houses of adobe construction; each homestead will cost approximately \$2,700. Eighty acres of land selected for unit I, 24 homesteads; 75 acres of land selected for unit II, 25 homesteads; ground and house plans approved; bids being requested. Land selected for unit III at Tucson; titles being examined.

Youngstown, Ohio (No. 10).—Allocation, \$500,000; number of homesteads, 137; acreage, 300 (approximate). For white collar type homesteaders, employed an average of 34 hours per week at average annual salary of \$1,320. Planned for 137 homesteads costing approximately \$3,600 each. Land optioned, selection being made; house plans approved; bids being asked.

Dayton, Ohio (Nos. 12 and 38).—Allocation, \$50,000 (unit I), \$309,400 (units II to V); number of homesteads, 35 (unit I), 165 (units II to V); acreage, 160 (unit I), not yet determined (units II to V). Planned for development in five separate units; to accommodate workers in the city's industries. For unit I money was loaned to a local corporation; houses under construction. The four additional units will be under Federal management; one to take care of Negro workers.

Duluth, Minn. (No. 15).—Allocation, \$104,000; number of homesteads, 40; acreage, 400. Situated 7 miles from Duluth. Homesteads are working men's gardens, planned to cost approximately \$2,500 each. Land purchased and being cleared; roads and utilities under construction; house plans being prepared.

Austin, Minn. (No. 16).—Allocation, \$125,000; number of homesteads, 44; acreage, 216. Situated near Austin; drawing homesteaders from workers in Hormel Packing Co. Provides for 44 homesteads, to sell for approximately \$2,800 each. Land acquired; construction of public utilities completed; house plans approved and bids requested.

Wilmington, Del. (No. 18).—Allocation, \$210,000; number of homesteads, 70; acreage, 309. Situated 5 miles outside of Wilmington. Complete homesteads planned to sell at approximately \$3,000. Project manager, architect, and engineer selected; house plans in preparation.

Houston, Tex. (No. 21).—Allocation, \$250,000; number of homesteads, 80; acreage, 320. For wage earners with incomes of from \$80 to \$150 per month. Homesteads expected to cost \$3,000 each. Five miles of streets completed; 20 houses completed; remaining 60 houses to be completed by October 1, 1934.

Dallas-Fort Worth, Tex. (No. 22).—Allocation, \$250,000; number of homesteads, 80; acreage, 593. For industrial workers. Units to sell for from \$2,500 to \$3,000. Land purchased; 205 acres improved; roads constructed; house construction to start within 2 weeks under contract calling for 80 houses at approximately \$140,000.

Wichita Falls, Tex. (No. 23).—Allocation, \$125,000; number of homesteads, 50; acreage, 210. To accommodate workers in the oil industry; homesteads to sell at average price of \$2,500. Land purchased; road construction completed; contract let for construction of 50 houses at approximately \$80,000. House construction now in progress.

Three Rivers, Tex. (No. 24).—Allocation, \$125,000; number of homesteads, 50; acreage, 160. For workers in glassware industry; homesteads to sell at estimated \$2,500. Project includes low-cost housing program for Mexican laborers. Land purchased; roads constructed; irrigation system being built; entire tract planted to cover-crops. Contract let for construction of 50 houses at approximately \$70,000; construction to begin within next month.

Beaumont, Tex. (No. 25).—Allocation, \$125,000; number of homesteads, 50; acreage, 205. Located in a great oil area; to consist of homesteads averaging 7 acres each, to sell at approximately \$2,500. Land purchased; roads constructed; public utilities being constructed. House construction under contract calling for \$75,000 for 50 houses to begin within a month.

McComb, Miss. (No. 27).—Allocation, \$80,000; number of homesteads, 25; acreage, 264. Designed to take up slack of seasonal employment. Development almost completed. Fourteen houses, 20 garages, and 10 barns and outbuildings completed; 6 houses almost completed; bids being asked for remaining 5 houses.

Laurel, Miss. (No. 28).—Allocation, 80,000; number of homesteads, 25; acreage, 238. Designed to accommodate industrial workers. Homesteads to be located on 5 acres with 3 to 5-room house; complete homestead to cost \$2,500. Ground plans approved; roads constructed; land cleared and 50 acres planted; bids received for house and utility construction.

Tupelo, Miss. (No. 29).—Allocation, \$80,000; number of homesteads, 25; acreage, 170. To accommodate textile workers. Homesteads complete, expected to sell for approximately \$2,700. Land purchased and cleared; roads built. Contract let for construction of houses at cost of \$44,000; construction to start within next month.

Richton, Miss. (No. 30).—Allocation, \$400,000; number of homesteads, 58; acreage, 8,000 (approximate). Designed to demonstrate better utilization of cut-over land. Families will depend on agriculture for subsistence and to a limited extent for cash. Land purchased.

Meridian, Miss. (No. 31).—Allocation, \$80,000; number of homesteads, 25; acreage, 233. For industrial workers. Homesteads planned to sell at \$2,750. Land purchased; road work completed; crops planted; bids being received for houses and utilities.

Rochester, N. Y. (No. 32).—Allocation, \$100,000; number of homesteads, 33; acreage, 50. Homesteads to consist of $1\frac{1}{2}$ acres each, costing an estimated \$3,000. Homestead group will be selected from technical, professional, and skilled occupational workers. Land purchased; ground plans approved; house plans being prepared.

Hattiesburg, Miss. (No. 33).—Allocation, \$80,000; number of homesteads, 24; acreage, 129. For workers in seasonal, part-time, or casual employment. Homesteads will average seven acres each; planned to sell at approximately \$2,750. Land purchased and cleared; roads built; contract let for house construction at approximately \$46,000.

Jasper, Ala. (No. 34).—Allocation, \$244,000; number of homesteads, 100; acreage, 2,096. Designed to aid in rehabilitation of coal miners. Each homestead will contain 20 acres and sell for approximately \$2,900. Land purchased; budget prepared covering first unit of 24 houses; bids asked.

Longview, Wash. (No. 36).—Allocation, \$160,500; number of homesteads, 60; acreage, 150 (approximate). Will draw homesteaders from lumbering industry. Each homestead will cost approximately \$2,675 and contain approximately $2\frac{1}{2}$ acres. Land under option, now being purchased; streets being constructed.

Los Angeles, Calif. (No. 37).—Allocation, \$410,000; number of homesteads, 140; acreage, 140. Provides for 140 homesteads of 1 acre each. Homesteaders from partially employed industrial workers. Each homestead will cost estimated \$3,000. One hundred acres purchased; bids being requested for house construction.

Granger, Iowa (No. 39).—Allocation, \$125,000; number of homesteads, 50; acreage, 224. Four- to five-acre homesteads for part-time miners. Average homestead will sell for approximately \$2,500. House plans prepared in Washington office.

Taylors, S. C. (No. 40).—Allocation, \$100,000; number of homesteads, 40; acreage, 231. For workers in bleaching and textile industries; average annual income about \$900. Five and three-quarters acres for each homestead; houses to be built at cost of \$1,800 each. Land purchased; project manager appointed.

La France, S. C. (No. 41).—Allocation, \$50,000; number of homesteads, 20; acreage, 116. Workingman's garden type for textile workers; average annual income per family about \$800; each homestead allotted $5\frac{3}{4}$ acres. Houses to be built at estimated average cost of \$1,800 each. Land purchased; project manager appointed.

Marshall, Tex. (No. 47).—Allocation, \$125,000; number of homesteads, 35; acreage, not yet determined. Designed for part-time workers in seasonal industries. Homestead units to sell for estimated average of \$2,500.

Lake County, Ill. (No. 49).—Allocation, \$275,000; number of homesteads, 90; acreage, 900 (approximate). Contemplates 10-acre homesteads, to be distrib-

uted in units of from 2 to 10 homesteads. Homesteaders will be drawn from industrial centers north of Chicago. Project manager and architect selected; preliminary plans being prepared.

Tulsa, Okla. (No. 55).—Allocation, \$125,000; number of homesteads, 48; acreage, 100 (approximate). Workingman's garden project; homesteaders employed by factories, in building trades, and in stores and offices. Homestead will consist of 2 acres with house of 4 or 5 rooms. Estimated cost of average homestead, \$2,600.

Bastrop, La. (No. 57).—Allocation, \$112,500; number of homesteads, 50; acreage, 250 (approximate). Proposes 5-acre homesteads near Bastrop. Houses will cost estimated average of \$1,600 each.

OTHER PROJECTS

Six projects for stranded industrial groups have been established or planned. These are described in the section of this report dealing with stranded groups.

Reedsville Experimental Community is described in a special section.

Not included in the above list of projects are a number which are still in the planning stage, or are being studied with a view to their eventual adoption or rejection. These are located in the following States: Connecticut, Colorado, Pennsylvania, Alabama, Montana, Ohio, Arkansas, Virginia, North Carolina, Michigan, Florida, Kentucky, South Carolina, Maryland, Missouri, New Hampshire and New York.

Tentative allocations of funds have also been made for problem areas of which studies are being made. In addition to States where projects are already established or planned, Utah and Oregon are included in this tentative allocation.

PURPOSES AND FUNCTIONS

In carrying out the intent of Congress as expressed in section 208, the Division of Subsistence Homesteads has conceived its purposes to be as follows:

1. To assist in the decentralization of the overbalance of population of crowded industrial cities.
2. To encourage this decentralization by demonstrating that part-time wage work may be profitably combined with part-time work on small farms and gardens.
3. To test whether through this means stranded industrial groups can be rehabilitated without being transplanted to new areas, and, to this end, to induce industry to come to potential employees ready and anxious to work rather than to move the people to the industry.
4. In a more limited way, and in special areas, to conduct demonstrations of rural rehabilitation, thereby attracting the inhabitants of urban areas back to the land.
5. In all cases to raise the standard of living of the homesteaders affected, and to demonstrate that a livelihood which allies pay-roll employment and subsistence farming and gardening will make for economic stability, not only of the individual but of the Nation.

6. To act as experimenter and demonstrator, so that States, municipalities, and private enterprise may be encouraged to undertake subsistence homestead programs of their own, and in their undertakings be able to follow a path thoroughly tested and proven by this Federal Division.

It should be emphasized that the principal responsibility of the Division of Subsistence Homesteads is to assist families who are on an economic level above that of the sheer relief group. Congress specified that loans, not grants, should be made and that homesteaders should repay these loans. The Division must, therefore select homesteaders with a reasonably assured income.

TYPICAL SUBSISTENCE HOMESTEAD

The average homestead approximates 5 acres in size. A typical house has from 4 to 5 rooms. In nearly all cases, with the homestead go essential farming and gardening tools, seed and fertilizer, and some livestock.

Costs vary, but the attempt is made to create a homestead which will sell complete, land, buildings, equipment, and livestock included for an average of approximately \$3,000.

ORGANIZATION

During its early months, various modifications of the original organization of the Division were found necessary. The Division was organized, approximately on March 1, 1934, into three main sections: Planning, construction, and operations (now community management).

Beginning in June, steps were taken to bring about a further reorganization, now in process, the object of which is to integrate the work of the Division into a still more efficient pattern.

A principal motive behind this last reorganization lies in the fact that on April 13, 1934, the character of community supervision was amended by an order of the Secretary of the Interior ending project management through local corporations and completely federalizing all projects. (See section of the report on "legal problems.")

PROJECT PLANNING

The Division of Subsistence Homesteads has had little opportunity to originate projects for its own program. It has had to depend chiefly upon outside individuals to supply the suggested locations and types of projects. Out of proposals and requests of all types, 601 projects requesting loans approximating \$500,000,000 have been considered in some degree worthy.

PROJECT TYPES

In establishing homestead communities, the following types of development have been considered:

Most numerous and most important of the project types is that designed to accommodate part-time or low-wage industrial workers. A second type deals with the so-called stranded industrial population. A third type, limited to a few projects, has been established to deal with stranded agricultural populations.

Projects are established without discrimination as to race, creed, or color. The important problems faced by Negro populations, both in the South and in the North, are being dealt with. There are several projects in the process of planning which will serve the Indian population. The Mexican element in the Southwest has been provided for. It was also considered that certain of the insular possessions should receive their portion of the allocation; a project, therefore, has been planned for the Virgin Islands.

FUTURE PLANNING

The future of the Division contemplates the origination of projects within the Division rather than through outside sources. An originating unit has been set up whose function is to survey the country as a whole in such a way as to determine where the various types of projects may be most effectively undertaken.

CONSTRUCTION

In developing the planned projects, the Division has faced the problem of providing land adequate in size and fertile enough in nature to grow the necessary foodstuffs, and houses sound, well designed and of sufficient size to accommodate the homesteaders' families—all this within a very limited budget.

HOUSES

The standards of the Division require: (1) Simplicity in design; (2) suitability to local climatic conditions and traditions; (3) planning to encourage the usability of all rooms; (4) provision of living rooms with adequate space for family use; (5) arrangement for easy access between kitchen and living room (due to cost, few dining rooms can be provided); (6) provision of kitchens with cross-ventilation, and space and built-in equipment essential to convenient operation; (7) adequate bedroom space for each member of the family.

It is seen to that the materials used are of the best possible quality, commensurate with the homesteader's ability to liquidate the cost of his homestead. Homestead houses must be of such sound con-

struction that maintenance costs will be low over the extended purchase period.

These essential features must be achieved at a minimum cost. Earlier houses have cost somewhat more, but houses now under construction will cost, it is estimated, as low as \$2,000 or even \$1,500. Progress to date indicates that this cost level can be attained.

Homestead houses vary in size from 3 to 6 rooms, but only such 3-room houses are designed as may be expanded to at least 5 rooms with a minimum of alteration.

COMMUNITY MANAGEMENT

As the development of the Subsistence Homesteads program has proceeded, the operations section, in the future to be known as the "community management section", has grown in importance and duties. To date 23 projects have progressed to the stage of operations.

A total of 13,934 applications have been received for 2,176 homesteads, exclusive of the stranded group projects. Tentative selections have been made of 618 applicants, and 145 homesteaders definitely have been accepted. The average annual income of families accepted is \$1,258.85; the average size of the families is 3.77; one member of each family has employment in local industries.

The selection of homesteaders is based on age, health, cash income, nationality, farm experience, adaptability and attitude toward a subsistence homestead life. All homesteaders must be American citizens.

Agricultural production has been started in the case of several projects. To date, 1,244 acres of land are under cultivation; feed and food commodities are being grown, and 14,377 quarts of vegetables have been canned.

STRANDED GROUPS

Allocations have been set aside for six projects, to be developed under the self-help plan, for stranded groups of unemployed to whom the future, even with complete economic recovery, holds no industrial promise.

One project, Westmoreland, was located in southwestern Pennsylvania; Tygart Valley was selected in central West Virginia; Cumberland Homesteads in central Tennessee; southern Illinois is the site of another project. Two more projects have been located, one in central Pennsylvania, another in Kentucky.

The last two projects above were approved so recently that nothing had been started in their development prior to June 30. The Illinois project is just getting under way.

Progress in more detail on the three projects furthest advanced is as follows:

Westmoreland County, Pa.—At Westmoreland, 92 homesteaders have been selected, 82 of whom are working on the project. Work is going forward on the house construction. A large flock of pure-bred chickens is being raised. One hundred acres of hay and 68 acres of wheat have been harvested, and crops of potatoes and truck vegetables are flourishing.

Tygart Valley, W.Va.—At Tygart Valley, 99 homesteaders have been selected, 61 of whom are working on the project. The foundations of 15 houses have been completed and the first-story framing of 14 houses is up. Three hundred acres of land have been planted to vegetable crops. A limestone quarry has been opened up.

Crossville, Tenn.—At Cumberland Homesteads, 167 homesteaders have been selected of whom 115 are working on the project. Nine houses are under construction, while 25 barns, 38 poultry houses, and other small outbuildings have been completed. Three hundred acres of land have been planted. A sawmill, operated on the project, has sawed 430,000 feet of lumber and 400,000 shingles from timber cut off the property, which is being used in the construction of houses and outbuildings. A stone quarry has been opened up to supply building material for the houses.

REEDSVILLE EXPERIMENTAL COMMUNITY

Reedsville Experimental Community, near Reedsville, W.Va., while one of the stranded group type, falls into a distinct category. The project involves the establishment of subsistence homesteads for the families of 200 stranded coal miners from the closed mines of Preston and Monongahela Counties. But in addition to performing the homestead function common to all projects, the Reedsville project is also an experimental undertaking.

At Reedsville, preference is given to homesteaders who have large families of young children. Homesteaders are being employed on land improvement, construction work, and community farming prior to the establishment of factories which are expected to be brought to the community by private interests.

Each homestead comprises approximately 5 acres. The first 50 houses consist of remodeled portable houses with full basements, hot air pipe furnace, and modern plumbing. These houses are now complete, and 32 are occupied as of June 30, 1934. The 150 houses still to be built will be of standard frame construction equipped with a combination cook stove and blower heating plant, a small basement for vegetable storage, and modern plumbing.

The land so far acquired, comprises approximately 1,100 acres. Additional land may eventually be purchased. An original allocation of \$600,000 is expected to be increased when plans for further development of the project have been completed.

Reedsville Experimental Community, as its name has indicated from the first, has been, and will continue to be, the testing ground

where the Division of Subsistence Homesteads conducts various experiments in community planning, community farming, house construction, education, and in other fields where the solution of some particular problem will prove of benefit to the entire subsistence homesteads program. Through the experiments at Reedsville, the Division has already been able to cut costs and apply tried methods of planning, construction, and management in the case of other projects.

LEGAL QUESTIONS

The Division of Subsistence Homesteads has been faced with numerous legal questions. The first problem was the formulation of an administrative vehicle which could serve as an agency for the establishment and operation of subsistence homestead communities. Pursuant to the departmental order of December 2, 1933, the Federal Subsistence Homesteads Corporation was formed under the laws of Delaware.

It was decided that for each subsistence homestead project, a subsidiary corporation should be organized, the stock of the subsidiary corporation to be subscribed for by Federal Subsistence Homesteads Corporation. This plan of operation was followed in the case of 30 projects and was continued until April 13, 1934, when the Secretary of the Interior ordered its termination and the operation of projects directly by the Federal organization.

The decision to operate the subsistence homesteads on a Federal project basis raised several urgent questions touching upon the status of the homesteads and their occupants. The statutes with reference to the purchase of real property, the awarding of contracts, and the exemption of Federal property from local taxation raised problems which have been submitted for opinions to the Solicitor of the Department of the Interior and the Attorney General of the United States.

At the close of the fiscal year preparation is being made for the organization of homesteaders into cooperatives for the operation of community farms, community stores, community workshops, community dairies and orchards. Work is likewise going forward for the preparation of contracts to be entered into by Federal Subsistence Homesteads Corporation with local authorities for the payment of gross cash sums annually in lieu of taxes, so as to compensate local governments for special services which they may render to subsistence homesteads projects, such as police protection, fire protection, and the provision of roads and school facilities.

No.	Project Name	Land		Houses	Total expenditures made by project	Expenditures, Washington office (unds.)	Total expenditures	Unexpended balance	Total allotment
		Cost, acquisition, clearing, and improving							
1	Birmingham, Ala.	\$180,339.98		\$378.52	\$192,913.17	\$11.54	\$192,924.71	\$557,075.29	\$750,000
2	Jasper-Putnam Counties, Ga.	97,432.39		11,090.36	124,451.77	264.58	124,716.35	875,283.65	1,000,000
3	Pender County, N.C.	84,839.12		400.60	164,545.67	23.00	164,568.67	835,431.33	1,000,000
4	Decatur, Ind.	7,985.75			9,685.30	7.76	9,693.06	115,306.94	125,000
5	Connecticut.							100,000.00	100,000
6	Westmoreland County, Pa.	138,170.99		7,606.92	166,381.84	22.88	166,404.72	438,595.28	625,000
7	Tygart Valley, W. Va.	124,207.67		1,020.82	176,210.50	239.89	176,450.39	498,549.61	675,000
8	Hightstown, N.J.	95,072.89			111,860.51	11.54	111,872.05	388,127.95	500,000
9	Phoenix, Ariz.	27.60			3,893.17	225.27	4,118.44	495,881.56	500,000
10	Youngstown, Ohio	1,471.65		11.54	13,290.56	3.98	13,272.10	486,727.90	500,000
11	Colorado.						3.98	499,996.02	500,000
12	Dayton, Ohio (first unit)								
13	Reedsville, W. Va.	173,214.41		215,128.01	560,122.88	917.00	561,039.88	38,960.12	600,000
14	Pennsylvania.							200,000.00	200,000
15	Duluth, Minn.	5,496.91			5,496.91		5,496.91	98,503.09	104,000
16	Austin, Minn.	10,361.68			11,465.24	7.76	11,463.00	113,537.00	125,000
17	Alabama.							200,000.00	200,000
18	Wilmington, Del.	21.45			430.07		430.07	209,569.93	210,000
19	Crossville, Tenn.	16,544.21		9,425.80	82,985.87	22.88	83,008.75	741,991.25	825,000
20	West Frankfort, Ill.	1,655.33			16,304.16	25.65	16,329.81	533,670.19	550,000
21	Houston, Tex.	56,764.28		22,556.58	94,192.87	19.10	94,211.97	155,788.03	250,000
22	Fort Worth-Dallas, Tex.	43,940.24			53,591.47	7.76	53,599.23	196,400.77	250,000
23	Wichita Falls, Tex.	20,838.75		418.95	27,090.95	27.91	27,118.86	97,881.14	125,000
24	Three Rivers, Tex.	26,535.24		160.60	33,692.12	7.76	33,701.88	91,298.12	125,000
25	Beaumont, Tex.	12,767.34			18,683.04		18,690.80	106,309.20	125,000
26	Wisconsin.							749,924.81	750,000
27	McComb, Miss.	5,738.16		25,956.18	37,694.15	75.19	37,769.34	62,180.25	100,000
28	Laurel, Miss.	2,010.33			6,533.16		6,533.16	93,466.84	100,000
29	Tupelo, Miss.	6,289.37		1,055.97	12,308.66	161.57	12,470.23	87,529.77	100,000
30	Richton, Miss.	26,753.24		1,159.10	39,203.36	161.57	39,364.93	360,635.07	400,000
31	Meridian, Miss.	6,378.53			9,138.87	351.38	9,490.25	90,509.75	100,000
32	Rochester, N.Y.					3.98		99,996.02	100,000
33	Hattiesburg, Miss.	3,133.51		6,844.02	6,844.02	38.57	6,882.59	93,117.41	100,000
34	Jasper, Ala.	55,657.47			61,182.78	7.76	61,190.54	182,809.46	244,000
35	Montana.							148,000.00	148,000
36	Longview, Wash.							160,000.00	160,000
37	Los Angeles, Calif.							345,388.89	410,000
38	Dayton, Ohio (additional units)	63,772.50			64,611.11		64,611.11	309,400.00	309,400
39	Crauger, Iowa.					3.78		99,996.22	100,000

1 Land not purchased and paid for June 30, 1934. Amount shown is acquisition expense.

Division of Subsistence Homesteads and Federal Subsistence Homesteads Corporation—Allotments and expenditures, June 30, 1934—Con.

No.	Project		Land Cost, acquisi- tion, clearing, and improving	Houses	Total expendi- tures made by project	Expendi- tures, Washington office (undis.)	Total expenditures	Unexpended balance	Total allotment
	Name								
40	Taylor, S. C.		\$13,740.00		\$13,740.00		\$13,740.00	\$86,260.00	\$100,000
41	La France, S. C.							50,000.00	50,000
42	Montana							225,000.00	225,000
43	Ohio							236,000.00	236,000
44	Fort Smith, Ark.					\$18.21	18.21	89,981.79	90,000
45	Helena, Ark.					18.21	18.21	89,981.79	90,000
46	Onachita, Ark.					18.23	18.23	24,981.77	25,000
47	Marshall, Tex.								
48	(Reserved)								
49	Lake County, Ill.								
50	Pennsylvania								
51	Do.								
52	North Carolina							275,000.00	275,000
53	Florida							250,000.00	250,000
54	Michigan							300,000.00	300,000
55	Tulsa, Okla.							100,000.00	100,000
56	Kentucky							50,000.00	50,000
57	Bastrop, La.							281,070.00	281,070
58	South Carolina							125,000.00	125,000
59	Maryland							350,000.00	350,000
								112,500.00	112,500
								184,000.00	184,000
								500,000.00	500,000
			1,281,110.99	\$296,358.41	2,118,469.18	2,886.61	2,121,355.79	14,432,614.21	16,553,970

THE SOIL EROSION SERVICE

HUGH H. BENNETT, Director

ESTABLISHMENT OF THE ORGANIZATION AND ITS OBJECTIVES

The Soil Erosion Service was established in October 1933 under the office of the Secretary of the Interior, to administer a grant of \$5,000,000 made by the Federal Emergency Administration of Public Works for erosion work. An additional \$5,000,000 was allocated for the same purpose at a later date and became available for expenditure in late March 1934.

The objectives of the Soil Erosion Service are: (1) To demonstrate that the impoverishment and destruction of our remaining areas of good agricultural land by continuing erosion can be largely controlled; and (2) to lay the foundation for a permanent national erosion-control program of adequate scope to meet the acute land crisis created by wasteful methods of land utilization.

THE PROBLEM

Accelerated soil erosion resulting from improper land-use practices has been manifest since the early settlement of the country. The evil has been spreading up from year to year. It is estimated that the annual cost of erosion amounts to at least \$400,000,000 in directly depreciated soil values, not to count the ultimate cost in terms of land destroyed or impoverished, in the resultant silting of reservoirs, streams, and harbors; increased volume and frequency of floods, damage to low-lying fields by overwash of infertile erosional debris, and the impoverishment of farming populations. At least 35,000,000 acres of formerly valuable cultivated land already have been essentially ruined insofar as further practical crop use is concerned; and 125,000,000 additional acres, most of them still in cultivation, have been largely stripped of the productive topsoil, with a resultant decline in productivity ranging up to 90 percent. At least 100,000,000 acres of our remaining valuable agricultural lands are heading rapidly in the direction of land stripped of its topsoil, and thus are being transformed into marginal and sub-marginal land.

The most conservative estimates, such as leave out of consideration flood damage and the costly problem of silting of reservoirs and

streams, indicate that the full value of land impoverished and destroyed, together with the losses incurred through the creation of stranded populations, already amounts to not less than \$10,000,000,000. Actually, the cost has been much greater than this. It is not possible to calculate the financial equivalent of losses incurred through the destruction of the prosperity of whole regions, the disruption of farming communities, and the scattering of their populations by way of throwing hundreds of thousands of persons upon relief rolls or into a condition of meager subsistence obtained through bankrupt farming on erosion-depleted land. Neither is it possible to calculate the value which the 160,000,000 acres of formerly productive farm land, now either devastated or vastly reduced in value, would have at some future time under conditions of increased population, such as might call for the utilization of every possible productive acre.

Unless the evil is curbed in a far-reaching way, the possible losses from erosion during the next 50 years are obviously enormous. The annual \$400,000,000 direct loss in soil values washed away alone would accumulate to probably not less than \$20,000,000,000. To this would have to be added the values of, (1) great reservoirs filled with the products of erosion, (2) the unmeasurable cost to the Nation of economic disaster to irrigated areas dependent on such reservoirs, (3) transfer to relief rolls of tremendous farm populations, (4) virtual abandonment of large agricultural sections, and (5) economic devastation of large western areas dependent on grazing. Furthermore, within something like 50 to 75 years an estimated area of about 250,000,000 acres of valuable agricultural land will either have been essentially ruined insofar as further important agricultural use is concerned, or will have had its productivity reduced by from 30 to 90 percent. There would then remain not a great deal in excess of 150,000,000 acres of fully productive agricultural land; an area which might be insufficient to support adequately the population of the country. From a future point of view, the value of lands destroyed and impoverished by erosion probably will be measured not so much in terms of present market value as in terms of the value of the land plus the human values involved. If the evil of unrestrained erosion is permitted to continue, it is possible to predict with a considerable degree of mathematical certainty the time when American standards of living will begin to decline.

CHARACTER OF PROGRAM

To meet the threatening situation involved with this wastage of our most basic national resource, the Soil Erosion Service has established a series of representative watershed demonstration areas within the different major geographic and agricultural regions of the country where destructive erosion is prevalent. In each area there

has been set up a staff of specialists experienced in the technical aspects of erosion, land, agronomy, forestry, etc., who are rapidly getting under way a practical program of erosion control, seeking not only to protect the land but to increase the absorption of rainfall and to reduce the hazards of floods and silting. This program differs from any other ever undertaken in this country. The plan of procedure is not one of employing single and unsupported implements of attack, but it is definitely one wherein all practical measures of erosion control (which involves control of run-off by increasing absorption of the rainfall) are utilized in a coordinated, correct land-use program. This is not an agronomic program or a soils, forestry, or engineering program, but a program employing all of these measures in accordance with the needs and adaptability of every acre of land requiring treatment, so coordinated that the integrated activities will support one another to effect complete control of the erosion, flood, and silting problems of entire watersheds. Necessarily then, it is definitely an experimental-demonstrational procedure, since if the work succeeds in reducing silting or in minimizing the flood hazard, as a supplemental accomplishment to the primary purpose of erosion control, here will be for the first time in our history an example, experimentally determined, of the practical possibilities of focusing all our technical knowledge against the greatest destroyer of soil values and one of the principal contributors to increased floods and silting.

The procedure followed in the establishment and operation of typical demonstration watershed projects involves the following steps:

(a) The project areas are carefully selected, consideration being given to the representative character of the problems presented therein, their suitability to the application of a unified, well-conceived, effective program of land treatment, and the willingness of the farmers and land owners to cooperate in and help carry out the work. The regional directors are selected on the basis of long experience in related fields of activity, such as executive ability, and knowledge of the local soils, agriculture, and climatic conditions. Each director is provided with a competent staff of agronomists, soil specialists, agricultural engineers, and other technicians.

(b) The watershed projects, the regional directors and their staffs having been selected, the next step involves the preparation of a comprehensive practical plan for the control of erosion and reduction of floods and silting over all the lands within the watershed areas. This plan is based on the physical and chemical characteristics of the soils involved, the slopes, the climate, the vegetation, adaptable crops, and the agricultural practices of the areas, and applies all known methods of control, chosen for their particular adaptability to the particular situation. In the detailed plans careful considera-

tion is given to the needs of the farm as an economic unit in order that the property owners may not suffer financial loss and that their enthusiastic cooperation may be obtained.

(c) On the basis of carefully prepared land-use plans, 5-year agreements are entered into between the property owners or operators and the Government, whereby the owners or operators agree to carry out the land-use practices advocated by the Soil Erosion Service and to contribute certain labor and materials necessary for construction and installation of control devices, such as check dams, strip crops, terraces, contour furrows, new fences, and relocated fences. In return for these undertakings by the owners or operators the Government agrees to lay out the work, to provide the supplementary labor and material (which the farmer cannot supply) needed to put the cooperatively approved plan into operation, and to furnish seed, trees, and shrubs for the planting of areas taken out of cultivation because of their highly erosive character and consequent dangerous relation to good lands lying below.

(d) Upon the completion of the cooperative agreements, actual field work gets under way and the plans are put into effect as rapidly as is permitted by the local climatic and agricultural conditions.

An important phase of the program relates to the establishment of practical methods for the utilization of marginal and submarginal lands, since such lands must be retired from cultivation if erosion is to be effectively controlled. When this type of land occurs in a scattered fashion interspersed with productive fields, it is being planted to pasture or trees in such a manner as will make possible the production of supplementary income to replace that which the owners or operators formerly obtained through cropping and other land-use practices that caused exhaustion of their capital land assets. Where practicable, types of vegetation are utilized which furnish a food supply and coverts for the development of game resources, such as the farmers may make profitable use of by way of disposing of hunting privileges.

A much more difficult land-utilization problem is presented in those regions where marginal and submarginal lands exist in such large blocks that they cannot be profitably operated under private and individual ownership. Where such areas occur, it is the present plan to encourage their purchase by the Federal Government, the States, or the local communities, and to establish thereon State, country, or municipal forest or grazing reserves. These forests, if operated on a perpetual yield basis, would not only control erosion, but would also furnish a stable source of local employment to a considerable percentage of those impoverished farmers now living on the lands which would be purchased.

The object of the erosion-control demonstration areas is to put into practice those measures of control and correct land-use which have been established as effective regional implements of control through experiment and practice. There arise, however, problems and questions which require investigation and special studies if the measures are to be successful to the highest degree. Accordingly, in cooperation with other Federal agencies and with certain non-Federal agencies, the Soil Erosion Service has inaugurated investigations and experiments dealing with (1) the relations between rainfall, stream flow, and water-table levels, on the one hand, and land-use practices on the other; (2) the amount, intensity, and duration of rainfall within the project areas; (3) deposition of eroded material over flood plains and in streams and reservoirs; (4) establishment of geologic norms of erosion; (5) development of new and more economical or efficient methods of controlling erosion; and (6) the effect of soil erosion and erosion-control work on economic and social conditions. It is obvious that adequate information must be obtained on all of these subjects if erosion-control programs are to be carried out on the most practical and economic basis.

THE STATUS OF THE PROGRAM AS OF JUNE 30, 1934

The Soil Erosion Service was established in October 1933 with an initial grant of \$5,000,000 from the Federal Emergency Administration of Public Works. An additional grant of \$5,000,000 became available for expenditure during March 1934. The first few weeks of the organization's existence were occupied with the strenuous efforts of developing an effective administrative and technical staff. The first project was established in Coon Valley, Wis., in November 1933. Thereafter additional projects were established as rapidly as areas could be selected and adequate operative organizations set up, until in January 1934, with the establishment of project no. 10, on the Navajo Indian Reservation, sufficient work had been undertaken to obligate the first \$5,000,000 allotment. No additional projects were established until after the second \$5,000,000 allotment became available. The first of this second group of projects went into operation in March 1934 on the Muskingum Watershed in Ohio. Additional projects were established with comparative rapidity until the setting up of project no. 24, the latter part of April, had exhausted the second allotment, although, of course, a sufficient reserve was kept to provide for unforeseen contingencies and to carry out special surveys and to develop plans as need might arise.

Demonstration watershed projects.—Twenty of these projects were under way, varying in size from 25,000 to 200,000 acres, covering a total area of 2,620,000 acres. Each project involves such reorganization of land-use practices and the installation of such measures as are

needed to control both wind and water erosion, conserve water, control floods, and place farming on a practical perpetual-yield basis. Thirteen percent of the total work to be done under this allotment had been completed, 157,000 acres having been put under control on 2,178 farms. Out of allotments totaling \$7,050,000, \$1,066,635 had been spent or obligated. In evaluating these figures consideration should be given to the fact that 11 of the projects were established with funds which did not become available until March 1934, and that considerable time is required to complete necessary planning operations before a project gets into full operation. The element of crops already planted necessarily enters into the speed with which erosion-control operations can be put into effect, since certain phases of the work cannot get under way until the crops are harvested.

Projects on federally controlled land.—Two of these projects had been established, one on the Navajo Indian Reservation with an area of 15,000,000 acres, and one on the Gila River Watershed in Arizona and New Mexico, with an area of 8,200,000 acres. The Navajo project is on lands which contribute vast quantities of silt to Boulder Dam, and involves the preparation and application of comprehensive erosion-control, land-use and range-control measures. It also involves the reorientation of the entire agricultural-economic system of 45,000 Navajo Indians. This project was allotted \$1,000,000 of which \$284,711.14 had been expended or obligated. The completion of the work will require years and additional funds. The Gila project involves seriously eroded lands which contribute great quantities of silt to the Coolidge Reservoir. The work has been initiated with Civil Works Administration and Emergency Conservation Work labor, under supervision of the Soil Erosion Service. It is estimated that at least \$5,000,000 will be required to complete the stabilization of this important area.

Experimental and erosion-survey projects.—Two of these projects had been established, one in New York and one in Pennsylvania. These are regions in which erosion factors and methods of control are little understood. The New York and the Pennsylvania projects were about 5 percent completed. A proposed project in the Tennessee Valley had been held up by difficulties of land acquisition, and the funds for it may have to be reallocated.

Cooperation with the Civil Works Administration and the Director Emergency Conservation Works.—From December 15 to May 1 large numbers of Civil Works Administration laborers were utilized on the various projects. The most outstanding work being done on the Gila River Watershed in Arizona. Beginning with the current period, 22 Emergency Conservation Work camps were assigned to the Soil Erosion Service. Recent assignments of additional regular and

drought relief camps have increased to 51 the number of erosion camps being supervised.

Financial status.—Total expenditures and obligations of the Soil Erosion Service to June 30, 1934, were \$1,519,461.60 out of a total allotment of \$10,000,000. It is estimated that the remaining funds will be required for the completion of the projects now in operation. It should be pointed out that heaviest expenditures for equipment and material were made during the initial stages of the program and that hereafter relatively small expenditures will be required for this purpose, with larger expenditures devoted to employment.

Employment.—On June 30, 1934, 2,200 persons were employed by the Soil Erosion Service and approximately 5,744 man-months of employment had been furnished by the program since its inception. With the establishment of projects under the second \$5,000,000 grant, the curve of employment began to rise much more rapidly and it is expected to reach a peak employment of 6,500 some time in October or November. Thereafter, the curve will probably drop somewhat due to the difficulty of performing field work in cold weather. It will rise again during the spring of 1935.

THE FUTURE OF EROSION CONTROL

It will be impossible to maintain permanent prosperity over large areas of the United States if the present rapid destruction and impoverishment of our most valuable agricultural lands by accelerated erosion is permitted to continue. This process seriously threatens the welfare of large farming populations and, eventually, will result in the virtual abandonment of large regions and serious impairment of standards of living in other parts of the country, if not vigorously combated without further delay.

These conclusions are not merely expressions of opinion, but rather statements based on physically determined facts. The remedial step that inevitably must be taken is the application of a coordinated land-use and land-protection program applied in accordance with the specific needs and adaptabilities of all valuable land needing treatment. There can be no alternative, and the seeking of one will mean merely the putting off of those things which must be done, with a consequently enlarged and more difficult and costly job pushed off into the future. Whatever may be the wishes or inclinations of the people of the country, this task of increasing land destruction and impairment must be fought from now on. This enemy to the continuing welfare of the nation is out in the open and can never again be driven back into cover by essays, round-table discussions, and the academic opinions of those who do not know the land, what is taking place on it and what must be done to save it. Actually the job of control is one of the most difficult that mankind ever undertook, and

in America it is by far the most pressingly important undertaking standing out ahead of us—one that grows more difficult to handle as well as more costly, with every succeeding rain heavy enough to cause water to run down hill across unprotected slopes. It can be handled only by pooling the best brains of our specialists (of whom there are pitifully few), who know the multiplicity of soil conditions stretching across the country, their anatomical constitution, their numerous differing susceptibilities to erosional impairment and their imminent needs, as determined by their physical characteristics. With determined leadership, adequate funds and national understanding of the importance of overcoming the evil, the battle can be won. Without these things it cannot be won.

The entire problem of erosion control and watershed stabilization is so complex and wide-spread, and the chances for doing ineffective work which would destroy public confidence in the program are so great, it seems evident that the Federal Government must take the initiative in inaugurating and carrying out an adequate national land-use and land-protection program. Furthermore, the problem is interstate in character and its most threatening aspects relate equally as much to national welfare as to the welfare of States, communities, or individuals. Land misuse in the upper Missouri Valley may well contribute to flood damage along the lower reaches of the Mississippi River. Watershed denudation in New Mexico contributes to destructive floods and the silting of Federal reservoirs in Arizona. The creation of stranded farm populations on erosion-depleted land necessitates vast expenditures for relief purposes by the Federal Government. The intensified character of drought damage in the Midwest due to unnecessary loss of rainwater through accelerated run-off is reflected in the increased price of foods throughout the entire Nation. The Federal Government spends vast sums to reduce crop surpluses, much of which is produced on highly erosive lands that would be removed from cultivation under any intelligent land-use program. Examples of the effect of land misuse on national welfare could be multiplied indefinitely.

The acceptance by the Federal Government of the main responsibility for initiating and carrying out a Nation-wide land-use and erosion-control program would not in any way imply that the States, their minor subdivisions, and the property owners concerned should not play a highly important part in the work. In fact it is almost essential that they should play such a part and that they should provide a fair share of the necessary funds. The States in particular would have to be brought into close cooperation, since in them rests the power to tax and to establish zoning regulations required to control the use and misuse of land. An arrangement will need to be worked out under which the States and the Nation jointly share the responsi-

bility for the program but with the technical control and the general guidance of the work left in the hands of the Federal Government.

Any permanently effective land-use and erosion-control program will probably have to contain the following essential elements:

(1) The establishment of national, State, or local land-use zoning ordinances which will prohibit those types of land misuse which contribute to erosion and the production of floods.

(2) The conditioning of Federal grants for the control of erosion upon the establishment of suitable zoning regulations.

(3) The purchase by the Federal or State governments, or by local communities, of marginal and submarginal lands to be used as national, State, or community forests and grazing areas.

(4) The establishment of suitable mechanisms for the assessment of costs incurred in rehabilitating land and the determination of those percentages which must be contributed by the Federal Government, the States, the local communities, and the landowners, respectively.

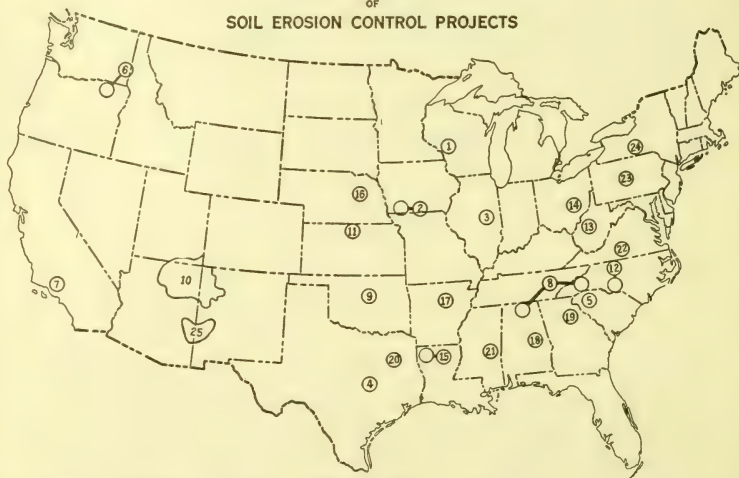
(5) The organization of the program in such a manner that it will utilize effectively and in a productive fashion the large amounts of relief labor which apparently will be available in this country for many years; plans to be completed well in advance of actual construction so that the program could be rapidly expanded and contracted as the needs of the unemployment situation might dictate.

Should a permanent national program of erosion control and land use be inaugurated, there would open up unlimited possibilities for the effective use of vast numbers of unemployed persons now dependent upon the Federal Government for their existence. If the tremendous expenditures now being made on unemployment relief were to be utilized in providing relief through a comprehensive program of erosion control, which would expand or contract its activities in accordance with the number of persons unemployed, there would be furnished not only a means for accomplishing the objectives of the program with relatively small additional expenditures, but also a solution would have been found to the demoralizing influences which tend to associate themselves with "made-work" programs such as are now being carried out with relief funds. The work which unemployed persons would do on such national program would in no sense be classed as "made-work" but rather would be considered to be just as worth while an activity as any other form of employment, since the objectives, quite aside from the purpose of providing employment, would be of paramount national importance. Such work would create values and improve and restore productivity to land resources. If the program were extended over a long period of years, it would afford exciting new fields of endeavor to the graduates of our technical schools who are now so largely either unemployed or engaged in uninteresting work.

Tabulation showing accomplishments of the soil-erosion service as of June 30, 1934

Acres surveyed by aerial methods.....	20, 102, 000
Acres surveyed for soils, slope, and erosions.....	1, 525, 052
Farms surveyed and mapped for soils, slope, and erosion.....	3, 925
Acres of ultra extensive range reconnaissance completed.....	17, 200, 000
Acres of extensive range reconnaissance completed.....	67, 000
Acres planned for land use and erosion control.....	430, 724
Farms planned for land use and erosion control.....	2, 647
Cooperative agreements signed.....	2, 108
Acres covered by cooperative agreements.....	433, 168
Farms covered by cooperative agreements.....	2, 179
Acres on which erosion was controlled.....	157, 960
Acres agreed to be retired from cultivation.....	24, 562
Acres agreed to be strip-cropped.....	42, 022
Acres actually strip-cropped, June 30, 1934.....	28, 850
Acres agreed to be terraced.....	48, 166
Acres actually terraced on June 30, 1934.....	26, 278
Acres agreed to be contour-furrowed.....	9, 414
Acres actually contour-furrowed.....	4, 403
Gully-control structures built.....	23, 831
Acres protected by gully-control structures actually built.....	43, 348
Number of trees planted.....	3, 213, 517
Acres planted to erosion-resisting crops.....	61, 901
Acres on which erosion-resisting crop rotations agreed.....	181, 859
Acres on which erosion-resisting crop rotations underway.....	151, 899

LOCATION
OF
SOIL EROSION CONTROL PROJECTS



Project No.	Name of Project	Regional Director	Office Location	Approx. Acres	Project No.	Name of Project	Regional Director	Office Location	Approx. Acres
1	Coon Creek	R. H. Davis	La Crosse, Wis.	100,000	13	Reedy Creek	Max M. Hoover	Spencer, W. Va.	100,000
2	West Tarkio River	R. E. Unland	Bethany, Mo.	175,000	14	Salt Creek	J. S. Cutler	Zanesville, Ohio	100,000
3	Big Creek	F. A. Fisher	Urbana, Ill.	150,000	15	Cooley Creek	A. H. Meyer	Minden, La.	100,000
4	Sangamon River	H. V. Gibb	Temple, Tex.	140,000	16	Cypress Creek	R. L. von Trebra	Minden, La.	47,000
5	Elm Creek	T. S. Buie	Spartanburg, S. C.	200,000	17	Plum Creek	Fred C. Newport	Albion, Nebr.	70,000
6	South Tiger River	W. A. Locke	Pullman, Wash.	125,000	18	East Cadron Creek	R. Y. Bailey	Conway, Ark.	125,000
7	Wildhorse Creek	Harry Roddick	Santa Paula, Calif.	50,000	19	Buck & Sandy Creeks	Loy E. Rast	Dadeville, Ala.	110,000
8	South Palouse River	C. B. Manford	Knoxville, Tenn.	150,000	20	Sandy Creek	L. P. Merrill	Athens, Ga.	100,000
9	Arroyo Las Rosas	N. E. Winters	Shiloh, Okla.	25,000	21	Duck Creek	G. B. Anders	Lindale, Tex.	25,000
10	Tennessee Valley	H. G. Calkins	Atbuquerque, N. Mex.	150,000	22	Okanibos River	S. F. Grubbs	Meridian, Miss.	150,000
11	Stillwater Creek	F. L. Duley	Mankato, Kans.	16,000,000	23	Banister River	A. L. Patrick	Chatham, Va.	100,000
12	Limestone Creek	J. H. Stallings	High Point, N. C.	150,000	24	Soil Erosion Survey	F. B. Howe, Acting	State College, Pa.	.....
13	Deep River .....	.....	.....	90,000	25	Soil Erosion Survey	B. P. Fleming	Ithaca, N. Y.	.....
14	Brown Creek .....	.....	.....	70,000	25	Gila River .....	.....	Safford, Ariz.	8,200,000

Soil Erosion Service, Department of the Interior tabulation showing financial status of program employment and Emergency Conservation Work camp assignments as of June 30, 1934

Project no.	State	Date established	Allotment	Expended and obligated June 30, 1934	Estimated total man-months employment to be furnished	To June 30, man-months of employment furnished	Number persons employed June 30, 1934	Number Emergency Conservation Work camps assigned to project
1	Washington administration		\$225,000	\$134,865.08		134	79	
2	Wisconsin	Nov. 1933	300,000	133,795.69	2,142	808	70	1
3	Missouri	do.	650,000	118,714.62	4,641	278	110	8
4	Illinois	Dec. 1933	300,000	98,860.82	2,142	253	54	4
5	Temple, Tex.	Nov. 1933	350,000	41,243.91	2,499	135	43	2
6	South Carolina	do.	350,000	83,893.20	2,499	374	191	3
7	Washington	Dec. 1933	350,000	62,667.45	2,499	197	80	1
8	California	do.	175,000	24,304.71	1,428	180	111	3
9	Tennessee	Apr. 1934	300,000	9,711.19	2,142	21	5	
10	Oklahoma	Dec. 1933	350,000	129,637.55	2,499	930	427	2
10A	Navajo	Jan. 1934	1,000,000	284,711.14	7,140	1,200	432	
	Arizona ¹							
	New Mexico ^{1,2}							5
11	Kansas	Dec. 1933	300,000	72,511.51	2,142	246	80	3
12	North Carolina	Feb. 1934	650,000	47,417.46	4,641	117	50	3
13	West Virginia	Apr. 1934	300,000	28,875.32	1,428	96	84	2
14	Ohio	Mar. 1934	425,000	30,042.28	3,034	91	57	2
15	Louisiana	do.	500,000	36,957.59	3,570	113	104	1
16	Nebraska	do.	275,000	31,698.82	1,943	57	32	2
17	Arkansas	Apr. 1934	300,000	13,879.48	2,142	281	52	1
18	Alabama	do.	300,000	25,192.53	2,142	33	22	3
19	Georgia	Mar. 1934	300,000	21,764.26	2,142	22	17	1
20	Lindale, Tex.	Apr. 1934	150,000	15,656.93	1,071	11	11	1
21	Mississippi	do.	350,000	22,362.36	2,499	45	39	1
22	Virginia	do.	350,000	17,448.20	2,499	36	19	1
23	Pennsylvania	do.	50,000	5,006.07	357	28	25	
24	New York	do.	50,000	3,885.48	357	8	6	
	Century of Progress		10,000	457.26				
	Reserve fund for equipment		50,000	24,391.69				
	Total		8,635,000	1,519,952.60	59,598	5,744	2,200	51
	Reserved for distribution as project needs develop		1,365,000					

¹ Gila River.

² Emergency Conservation Work and Civil Works Administration project only.

ST. ELIZABETHS HOSPITAL

(WILLIAM A. WHITE, M.D., Superintendent)

MOVEMENT OF POPULATION

On June 30, 1934, 5,191 patients remained in the hospital as compared with 4,981 on June 30, 1933, an increase of 210. This is accounted for by a relatively large number admitted and a smaller number of deaths and discharges than usual.

The total number of patients under treatment during the year was 5,875, as compared with 5,841 for the preceding year, an increase of 34.

The total number of admissions during the year was 894, as compared with 911 the preceding year, a decrease of 17.

The total number of discharges for the year was 426, as compared with 582 for the preceding year, a decrease of 156. Included in the large number of discharges during the year 1933 were over 100 patients transferred to Veterans' Administration Facilities, and about 40 transferred to the Department of Justice hospital at Springfield, Mo.

The total number of deaths for the year was 258, as compared with 278 for the preceding year, a decrease of 20, or approximately 8 percent.

The total number of discharges and deaths, combined, was 684, compared with 860 for the preceding year, a decrease of 176, or about 20 percent.

There were 57 burials in the hospital cemetery, as compared with 61 the preceding year. With the cooperation of the War Department the bodies of 3 service men, honorably discharged, were buried in the Arlington National Cemetery without direct money outlay; and 34 bodies were buried in Arlington Cemetery either at Federal or private expense, by outside undertakers. The remaining 164 bodies were taken for burial in various other cemeteries throughout the United States, one having been shipped to the Philippine Islands.

The daily average patient population was 5,049, an increase of 13 over the 5,036 for the preceding year.

Movement of patient population, fiscal year 1934

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1933.....	2,625	753	3,378	954	649	1,603	4,981
Admitted during year ended June 30, 1934..	437	129	566	226	102	328	894
Total number under care and treatment during year ended June 30, 1934.....	3,062	882	3,944	1,180	751	1,931	5,875
Discharged as—							
Not insane.....	7	2	9	0	1	1	10
Recovered.....	74	19	93	17	11	28	121
Improved.....	93	25	118	12	8	20	138
Unimproved.....	106	33	139	13	5	18	157
Total discharged.....	280	79	359	42	25	67	426
Died.....	111	56	167	50	41	91	258
Total of patients discharged and died..	391	135	526	92	66	158	684
Number of patients remaining on rolls June 30, 1934.....	2,671	747	3,418	1,088	685	1,773	5,191

ADMINISTRATIVE DEPARTMENT**OFFICE OF THE ASSISTANT TO THE SUPERINTENDENT**

Supplies.—The supplies produced on the hospital reservation, including farm and garden products such as potatoes, tomatoes, beans, parsley, spinach, squash, turnips, etc., were 273,426 gallons of milk, 112,265 pounds of fresh pork, 12,910 dozen eggs, 6,024 pounds of chicken, etc., 15,224 pairs of shoes and slippers, 5,781 brooms, 2,337 brushes, 800,000 loaves of bread, 3,200,000 rolls, 90,000 pounds of pastry, 2,215 mattresses, 2,055 pillows, 22,736 gallons of ice cream, and the laundering of 10,745,726 articles, in addition to hundreds of other items.

Amongst the items raised on the farm, in addition to the garden products, were 1,000 tons of ensilage corn, 88 tons of alfalfa hay, 30 tons of green hay, 71 tons of sudan grass and soybean hay, 75 tons of miscellaneous hay, and 1,000 bushels of ear corn.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops. The patients on the wards, under the direction of occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, and assisted in making stand covers, screen covers, tablecloths and other items.

All the steam, electricity, ice, and refrigeration used on the reservation was manufactured in the hospital shops.

Printing department.—As explained in the last report, a new electric press has been purchased for use and is being operated by an occupational therapist, with the hope of training some of the patients to assist in this work. It is believed the use of patients on the

presses will have a therapeutic value. During the past year there were turned out 105,000 copies of various classes of printed matter.

Dairy and cow barn.—The Holstein-Friesian herd has again been tested for tuberculosis and there were no reactions. The herd consists of 250 cows, 9 bulls, 92 heifers, and 63 calves, a total of 414 animals. This is the twentieth year that there have been no reactions from tuberculosis and is very satisfactory, as this is one of the largest accredited herds in the country.

Bang abortion disease manifested itself in the herd in 1932, and while in a way it has been eliminated it made a sudden reappearance during the past 3 months of the fiscal year, not in the matter of the number of cows aborting but in the agglutination reaction of the blood of five cows that aborted during the year. All cows have been bled several times by the United States Department of Agriculture, cooperating with the hospital in limiting the spread of this disease and as far as possible removing all those showing reactions.

The herd produced 273,426 gallons of milk during the past year, about 6 percent less than the previous year. The herd gave an average production of about 12,000 pounds of butter a year.

The quality of the milk, as indicated by about 25 bacteria counts, has been highly satisfactory, the average, well below 10,000 colonies per cubic centimeter (average about 6,800) being well within the requirements for certified milk.

The hospital continues to cooperate with the United States Department of Agriculture in the use of purebred bulls from its Beltsville (Md.) Experimental Station.

Piggery.—The hospital slaughtered 402 hogs during the year, which furnished 112,265 pounds of dressed pork, 38,000 pounds less than during the previous year. The reduction in the amount of pork deliveries was due to the fact that the piggery has not yet fully recovered from the depletion of the breeding stock due to porcine abortion reported 2 or 3 years ago. However, with the 406 hogs now ready for slaughter this fall and 365 spring pigs intended for slaughter by February, the prospect for a good supply of pork for the coming year is promising.

Farm and garden.—The weather conditions played a great part in slowing up production, especially of the garden products. Of the vegetables, carrots, turnips, Swiss chard, beans, cucumbers, eggplant, tomatoes, and cymplings, among others, made a rather poor showing, but the prospect for a good crop in each of these products would seem to be much better at the present writing, provided that the summer of 1934 does not have a drought. Onions, on the other hand, will be short during 1934 because of severe weather killing most of the onion

sets stored. Rhubarb has not measured up to expectations due to unfavorable conditions.

Diet.—The hospital continues the study of the diet. Not only is a greater variety of food being served to the patients and a larger variety of greens continued throughout the year, but efforts are being made to see that the food served is in a more appetizing manner.

Detached kitchen, Toner kitchen, superintendent's kitchen, and A kitchen have been equipped with gas ranges. These replace old worn-out coal-heated ranges and ovens; at the present time all of the kitchens are equipped with gas ranges, and there are no coal ranges on the reservation. This has the effect of expediting the meals, results in economy, and makes for better working conditions in the kitchens, especially in the summertime.

Cafeteria equipment has been purchased for the West Lodge dining room which will add 400 patients to those being fed by the cafeteria system. Plans are being drawn to equip the detached dining hall and the semipermanent dining rooms with cafeteria equipment, such as steam tables, etc., so that the patients fed in these dining rooms may use the cafeteria system. At the present time about 2,000 patients in the hospital are being fed through full or partial cafeteria system methods.

The kitchen furnishing food for the semipermanent group of patients, about 500, having been in use about 15 years, has become so dilapidated that it became necessary either to rebuild or replace it. The cost of rebuilding or replacing was more than the available funds. Under such conditions it was found of advantage to close this kitchen and feed the 500 patients of the semipermanent group from the continuous treatment kitchen. The total number now being fed from this continuous treatment kitchen is about 1,400 patients, about equal to those fed from the general kitchen.

The general kitchen has been painted. The scullery, toilet, and locker rooms in the detached kitchen have been painted. A dishwasher has been ordered for Oaks A dining room. Toner dining room has been painted, and the kitchen is now being painted. New dressing rooms, toilets, and showers are being installed at the employees' cafeteria.

The dietitians gave their regular course to the student nurses of the regular class, in addition to affiliate nurses from the Portsmouth Hospital and from the Children's Hospital, of Washington, D.C.

Ice cream and pastuerizing plant.—A total of 273,426 gallons of milk, or a daily average of 749 gallons, was clarified and pasteurized at 148° F., and cooled immediately to 42° F., when more than one-half was bottled for distribution to patients and the remainder issued in cans for use in the kitchens for cooking, baking, and for making ice cream.

Approximately 20 gallons of buttermilk were made daily and issued to the various kitchens.

A total of 22,736 gallons of ice cream, or a daily average of 62 gallons, was made.

Bakery.—The hospital installed a bread-cutting machine that permitted the slicing of bread before being wrapped and sent from the bakery. This does away with bread-cutting machines in the larger dining rooms and the possible handling of knives by patients in the smaller dining rooms, minimizing the danger from such conditions. It would also have a tendency of keeping the bread fresh for a longer period, as the bread being wrapped in paraffin paper after being sliced it is not necessary to open the paraffin paper until the bread is actually required to be used.

The output of bread during the year was 800,000 loaves, with 3,200,000 rolls and 90,000 pounds of pastry.

New tile floors have been put in the bakery hall and bread-cooling room to replace wooden floors.

Laundry.—The work of the laundry continues to increase. The number of pieces laundered during the year was 10,745,726, about 850,000 increase over the previous year. Notwithstanding this increase, during the year there has not been an increase among the paid employees.

Four double presses, two double sleeve ironers, and one 120-inch tumbler dryer have been added to the equipment in order to meet the increased production.

Shoe shop.—The work in the shoe shop continues to increase. This work furnished employment to about 38 patients for about 5½ hours each day, except Saturdays and recreation days. During the past year there were manufactured in this shop 5,514 pairs of house slippers; 3,989 pairs of men's oxfords; 2,514 pairs of men's high shoes; 918 pairs of brogans; 1,088 pairs of women's oxfords; 1,043 pairs of women's strap slippers; 202 pairs of women's house slippers, and 1,643 pairs of shoes were repaired. In addition to that, in the same shop there were made 2,337 brushes of all classes.

Additional machines have been installed in this shop for making belts, suspenders, and mats out of waste material.

Lawns and grounds.—The grounds adjoining the continuous treatment buildings and the south side of the tuberculosis building recently constructed have been regraded and sown with grass seed and 98 holes dug and filled with soil for planting of trees. It is planned to put in about 200 trees in the section around the new buildings this fall.

Fires.—There were several small fires without financial damage during the year. Fire extinguishers have been installed in all the new buildings, and regular fire inspections made of every building in the hospital during the year. Inspections have also been made of fire

hydrants, fire escapes, and frequent fire drills, which included the emptying of the buildings, have been part of the regular work of the fire department.

Automatic telephones.—The number of calls during the year over the automatic telephones were 1,369,458, a daily average of 3,751, or an hourly average of 156.

Construction.—A tunnel to contain the steam pipes and electric conduits to connect with the new male receiving building has been completed.

The wooden floor construction of porches at both ends of P building has been replaced with new floors of reinforced concrete, using a quarry tile finish.

The old dairy barn has been entirely reconditioned by removing the wooden floor and wooden beams and replacing same with reinforced concrete and beams. This barn was provided with gutters and floor drains for cleaning; also a concrete manger and feed troughs. Metal stanchions, pens, and gates were installed. An extension was built to the bull pen and yard to accommodate four additional bulls.

The old steam pipe tunnel under Nichols Avenue, to the north of the subway, became cracked and showed evidence of crumbling in several places due to the vibration of traffic from above. This was relined with reinforced concrete.

Gas mains were laid from the circulating library to Toner kitchen and to the detached kitchen. Also from Nichols Avenue to the A kitchen.

One thousand and twenty-six square feet of wood floor in the bakery was reconstructed and replaced with reinforced concrete, using quarry tile finish for floors.

The tile flooring in the dishwashing room of the detached dining room was replaced.

A steam pipe tunnel was built large enough to contain electric conduits to connect with the new female receiving building.

The third floor of the laundry was remodeled, and the repair room moved to this floor. Changes were made on the second floor to increase space required for the new pressing machines purchased, the room formerly occupied by the repair shop permitting increased space for sorting clothes.

Continuous-treatment building no. 2 has been provided with a hospital radio and a speaker on each ward.

Twenty-six automatic telephones have been installed throughout the new male receiving building.

Four thousand six hundred and thirty-five feet of 100-pair and 791 feet of 50-pair lead covered telephone cable has been placed in the hospital system. This cable extends from the shops building tele-

phone main distribution frame to what is known as N building, on the east side of Nichols Avenue.

Installation of an outlet on the south side of the refrigeration plant to flood the new stack has been completed. The Department of Commerce maintenance man advises that the Department intends to install brackets and move one of the two flood lights now located on the roof of the power house to this new location. This is for protection of the various aviators who are flying in this direction at night.

The work of remodeling the power house has been completed. The east boiler room was extended 30 feet, and the side walls of the old part were raised 16 feet to accommodate the space required for new and larger boilers. Metal casement windows were installed in all walls extended, which will afford additional ventilation. Approximately 200,000 bricks were used in this extension. The roof consists of reinforced concrete slab with a tar and gravel finish. The center section of the roof was provided with a monitor ventilator with pivoted metal sash to afford ventilation immediately over the boilers.

A reinforced concrete floor was built in the new boiler room at an elevation of the firing floor.

A trench was dug through the old boiler room and lined with concrete to provide for an ash discharge pipe; also a similar line under the combustion chambers in the rear of these boilers. A 12-inch drain line was laid through this room to provide drainage from the boiler rooms. The drainage line had to be relocated on account of the concrete coal silos which had been erected on the outside of the building.

Separate contracts were approved as follows: (1) For razing the old boiler room and foundation of new stack; (2) for three 750 horsepower boilers; (3) for stokers and equipment connected with boilers; (4) for iron work, floors, etc., connected with boiler room; (5) for piping of boilers; (6) for new heaters; (7) for a new stack, duplicate of the old stack; (8) for coal handling machinery, silos, etc.; (9) for ash handling machinery, vacuum system for withdrawing ashes, etc.; and (10) for two new pumps.

Practically all of this work has been completed and accepted, except the two pumps and some work on the vacuum ash handling machinery. In connection with this work, additional sewer lines, water lines, steam lines, toilets, lavatories, shower baths, and other installations were required for the use of the employees and to put the buildings in proper repair.

Public Works projects.—The Administration of Public Works allotted money to the hospital for a new female receiving building and for 13 reconditioning projects. Contracts have been awarded for the new female receiving building, and this work is now under process. It has been delayed to a great extent by strikes and trouble incident to the driving of piles. The work of pile driving is now proceeding under

3 shifts of labor, and as soon as this is completed the contractor has been directed to put on 2 shifts of men in order to expedite the completion of this work.

The reconditioning projects are as follows:

Federal project no. 2.—Install screens and grilles in continuous treatment buildings. This provided grilles over stairways to prevent patients from jumping or falling and resulting in accidents and screens in corridors and around radiators, for the proper protection of the patients. This work has practically been completed.

Federal project no. 3.—Roads and walks around continuous-treatment buildings, new buildings just constructed. This work has just been completed.

Federal project no. 4.—Roads and walks around male receiving building, a new building just completed. This work has been finished.

Federal project no. 5.—Remodeling the plumbing of the old sections. This entire amount has been expended, and as much of the work as could be completed within the sum authorized has been finished.

Federal project no. 6.—Replacing old steam pipes in tunnels. This entire amount has been expended, and the work completed within the limitation of the allotment.

Federal project no. 7.—Widening and enclosing porches of West Lodge 1. This resulted in replacing wooden floors with fireproof floors of concrete and brick, enlarging and furnishing day-rooms for patients. This work has been completed.

Federal project no. 8.—Furnishing cold storage and extension for general storeroom. This has been completed.

Federal project no. 9.—Widening roads and providing auto parking space. This work has been completed.

Federal project no. 10.—Additional water section including addition to Oaks-A building. This entire amount has been expended, and the work as far as could be done within the allotment completed.

Federal project no. 11.—Furnishing water sewers and drains for the new buildings known as continuous-treatment buildings and male receiving building. This work has been completed.

Federal project no. 12.—Repair and renovate greenhouses. This work has been finished.

Federal project no. 13.—Renovating laboratory. This entire amount has been expended, and the work done as far as could be under the allotment.

Federal project no. 14.—New floors throughout the west side service. This work has been completed.

Male receiving building.—The male receiving building, which has been under construction for the past 21 months, was completed and turned over to the hospital on June 29, 1934. This building has a

capacity of 400 beds. It is of monumental design, being 5 stories in height, with a beautiful entrance 2 stories in height, making a proper setting for the building. This is the building in which all white male patients will have their first reception, and efforts are made to give as good an impression upon their reception as possible. Quite a large number of these patients will probably be discharged from the hospital before being transferred to other buildings. This building contains all of the facilities for giving the various classes of treatment required for mental patients.

Disbursements.—The total amount of money disbursed by the hospital from the various appropriations and trust funds during the year was \$3,350,000. The total collections, including reimbursements to the regular appropriations personal funds of patients and pension trust funds, were \$2,160,000.

Supplies.—Orders were placed for supplies during the year amounting to \$1,640,000. Of this amount, \$1,183,000 was covered by formal contracts entered into by the hospital directly with contracting parties. These formal contracts entered into by the hospital included the female receiving building and furniture for equipping the male receiving building. There were 270 of these contracts.

Personnel.—The total number of employees on the hospital rolls June 30, 1934, was 1,549 of which 1,516 were permanent employees and 33 temporary employees, an increase in the permanent force of 102 employees and a decrease in the temporary employees of 60, or a net increase of 42.

During the year Congress passed an act reducing the percentage of deduction from wages of employees from 15 percent to 10 percent beginning February 1, 1934, and from 10 percent to 5 percent beginning July 1, 1934.

Limitations on the filling of vacancies were continued.

Legislation authorized the Public Works Administration, through which allotments were made to the hospital, resulted in the employing of more than 100 men for an average period of from 6 to 9 months.

The duties of clinical psychiatrist and director of laboratories were consolidated upon the acceptance of resignation of Dr. Walter Freeman, and Dr. Nolan D. C. Lewis was appointed as director of laboratories in charge of both activities.

During the year several of the old employees were retired from the service on account of age, including:

William H. Perkins.....	Foreman carpenter.
Samuel Keese.....	Plasterer.
Michael F. Drennan.....	Charge psychiatric nurse.
Robert F. Poston.....	Painter.
Edward Willer.....	Cabinet carpenter.
James S. Cook.....	Fireman.

The following were retired on account of disability:

Jesse J. Guin.....	Attendant.
Hattie L. King.....	Do.
Maude Butler.....	Do.
J. S. Edelen.....	Do.
Alice K. Walter.....	Do.
Edward D. McKinney.....	Do.
John T. Cook.....	Milkman.
Elvira Hanna.....	Waitress.
Norman A. Butler.....	Psychiatric nurse.
Gladys Speith.....	Do.
George W. Arendes.....	Assistant baker.
Samuel H. Todd.....	Assistant foreman of laborers.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year this department furnished occupation for 913 patients, slightly less than during the previous year. This work included weaving, sewing, toy making, woodwork, basketry, etc. In the industrial department there were made 24,960 sheets, 11,020 pillowcases, 26,532 towels, and 3,785 dresses. Many of the articles made by these patients were for the general use of the hospital. The approximate value of all supplies made was \$31,305.

Red Cross.—The Red Cross continued to maintain a hospital unit during the past fiscal year. The psychiatric social workers attached to this unit are primarily concerned in case correspondence and contact work. During the past year that office sent out 3,023 letters and received 3,013 letters concerning patients and their affairs.

The psychiatric case-work staff has continued filing pensions and the referring of other types of claims to the proper authorities for action. During the past year Red Cross representatives participated in the handling of 375 claims.

Three thousand four hundred tickets of all classes were donated for the use of patients, about the same as during the previous year. These tickets covered baseball, football, athletic events of all sorts, moving pictures, etc. During the year there were 89 moving picture shows in Hitchcock Hall, on the hospital reservation. The athletic director has continued the work of organizing, supervising, and assisting the patients to participate in about 70 athletic events.

Probably the most important single event of the year was what is known as the Red Cross Institute, which was assembled and conducted through the cooperation of St. Elizabeths Hospital and the American National Red Cross. This institute began on April 12 and continued through April 14, 1934. The delegates to this institute were experienced Red Cross workers, who had come from all over the United States to the National Convention of the American Red Cross,

which met in Washington. The Red Cross Institute for Home Service Workers opened at St. Elizabeths Hospital at the Red Cross house. The meeting was addressed by a number of hospital officials who briefly explained the various aspects of the hospital to them. The delegates were then separated into groups and taken on a tour of the hospital; they returned to the Red Cross house where they were given an opportunity to see an occupational therapy and industrial exhibit. In the evening the superintendent of the hospital gave an opening address, his subject being "The structure of the personality." He was followed by several other members of the staff who spoke on interesting subjects. Clinics were conducted from time to time by various members of the hospital staff and included a round-table discussion where various angles of the approach, contact, and care and treatment of mental patients were discussed.

MEDICAL DEPARTMENT

Library.—The library is divided into two parts, primarily that noted as the medical library, and that noted as the patients' library. The number of volumes in the combined library is approximately 30,800. Ninety books were added to the medical library by purchase and gifts, 600 books were added to the patients' library. The hospital subscribes to several newspapers and approximately 90 periodicals, magazines, etc. About 5,000 magazines, mainly surplus, were received from the Library of Congress and distributed to the various wards. Approximately 150 books are issued daily, and there are about 3,500 books in constant circulation.

Social-service department.—The work of this department during the past year included training of students from the hospital training school and from the social-service school.

The social service report from July 1, 1933, to June 30, 1934, showed the following:

Number of out-patients on rolls July 1, 1933.....	149
Number of out-patients on rolls June 30, 1934.....	93
Average number on rolls per month.....	131
Number of patients discharged from the rolls.....	65
Number of out-patients under care during the year.....	284
Interviews at the hospital pertaining to the work.....	569
Number of visits made in regard to this work.....	2, 791

Training school.—Twenty-four students graduated in the nurse and psychiatric aide class during the year. The total number of students on the rolls July 1, 1933, was 63; there were also 21 affiliate students and 34 postgraduates. On June 30, 1934, there was approximately the same number. As of June 1, 1934, 20 preliminary students were admitted. These were selected from the top of a certified list of the

Civil Service Commission, consisting of 72 names of applicants who had passed out of a total of 1,100 candidates.

Medical and surgical wards.—The treatment of selected cases of pulmonary tuberculosis by the method of artificial pneumothorax, instituted during the previous year, was continued during the year just ended, with satisfactory results.

The number of patients treated with high voltage roentgen therapy during the year increased markedly over any previous year and in certain instances with excellent results so far.

The new cold quartz ultraviolet ray equipment purchased last year has proved to be of much value in many conditions where the old hot quartz type of equipment could not be used with advantage. Among these may be mentioned the treatment of endocervicitis at the gynecological clinic.

Owing to the fact that for a number of years we have been unable to produce successful inoculations with malaria, of either the tertian or quartan type, in many of our colored parietic patients, we undertook to treat these cases with the form of fever therapy produced by the injections of vaccine of typhoid fever, by the summation method. To date we have so treated about two dozen cases and the treatment is under way with additional ones. We have found no difficulty in producing fever reactions at will, to any degree within desirable limits, and the patients have always stood the rigors of the treatment admirably. The result so far as paresis is concerned is still a matter to be determined.

Dr. Charles L. Billard, for many years the attending physician for the eye, ear, nose, and throat clinic, resigned, and Dr. Skilling was appointed as attending ophthalmologist.

Male services.—The completion of the new male receiving building will result in several changes during the coming year. Continuous treatment building no. 1, which is at present being used as the male receiving building, will be in condition to receive other patients. At present it is contemplated that these patients will be moved in from P-building, permitting P-building to be used by the female department.

During the year efforts have been made to establish in each service a so-called "occupational index." A card is maintained for each patient showing the date of assignment to some particular work, the date when the work was stopped and the reason therefor, and the dates of any subsequent assignments and the types of work. Where possible the reason for changing a patient from one type of work to another has been briefly set forth, so that we have at all times a longitudinal section of the patient's occupational adjustment during his residence in the hospital. This index also enables the physicians at a glance to see the relative number of idle patients on each service. In

addition, there has also been established an index of the occupations followed by the patients before their admission to the hospital, which permits the physicians to assign patients to the type of work most closely allied to their previous occupations.

During the year the Indian patients, numbering 71, receiving treatment at Canton, S.Dak., were transferred to St. Elizabeths Hospital for treatment and the Canton Hospital closed. The male patients of this class were taken care of in a ward of continuous treatment building no. 2.

There was quite a decrease in the number of criminal patients confined in the Howard Hall department, due to the opening of the Department of Justice Hospital at Springfield, Mo., and the transfer of about 40 patients from St. Elizabeths Hospital to that institution.

There has been a general reclassification of patients, with an effort to put paroled patients from Richardson group on the west side, the working patients in the detached group service, and the more helpless patients, showing varying degrees of deterioration, in the semipublic building group.

Of course, the biggest problem to overcome in the hospital at the present time is the crowded condition. The patient population seems to be growing more rapidly than additional beds will be provided.

Female services.—In this department, as in the male services, the principal problems under discussion are plans for the distribution of patients on wards during the coming year. The buildings are crowded and additional beds are needed. With the limited appropriations it is difficult to get adequate personnel. This seems to be the day of change in the order of things, and one of the problems of the staff is to maintain the high standard of treatment for patients with the provisions that are at hand. When P-building is released to women this will help in some way to solve the difficulty, and then when the female receiving building has been completed this will go a long way toward giving the additional beds required.

Psychotherapy.—A monthly average of 18 selected patients were afforded psychotherapy.

With a few exceptions all admission diagnostic conferences have been conducted by the clinical psychiatrist.

Two hundred lectures and clinics have been given by the doctor in charge and assistants for the local medical schools, schools of nursing, and naval medical officers.

Work on the comparative psychiatry of the Negro and Indian has been conducted through the year.

An extensive research into the nature and causes of suicide has been carried on during the year, including ethnologic, psychiatric, and psychoanalytic methods of approach.

A comprehensive research problem in dementia precox has been in process of organization during the year.

Laboratory.—The work of the laboratory has increased in nearly all respects. Dr. Lewis, the new director of laboratories, has continued all the work previously started and efforts are made to branch out into new assignments.

NEEDS OF THE HOSPITAL

An estimate of \$1,218,780 for the support, clothing, and treatment of the patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1936, was recommended. This amount was based on 1,850 patients. The hospital at the present time has 5,200 patients. The average for the fiscal year 1934 was 5,049, as compared with 5,036 the previous year, an increase of 13. The average for the fiscal year 1936, it is estimated, will be 5,510, 310 more than the present number. The 5,510 are divided as follows: 1,850 Federal patients, appropriated under the title of St. Elizabeths Hospital in the Interior Appropriation Act; District of Columbia patients, 3,300, beneficiaries of the District of Columbia, and appropriated for in the District of Columbia Appropriation Act; United States Veterans' Administration beneficiaries, 120, and carried in the appropriation of the United States Veterans' Administration; United States Public Health Service beneficiaries, 130, and provided for in the appropriation for the Treasury Department, under Public Health Service; United States Soldiers Home beneficiaries, 35, and payment for these to be received from that service; Indians, 75, received from the Indian reservations, who will be chargeable to the Bureau of Indian Affairs (conservation of health among Indians).

The rate estimated for the care of patients during 1936 is \$1.80 per capita per day. This includes the basic salary without the 5-percent deduction at present in effect. At the present time the rates of food supplies, forage, textiles, etc., seem to be on the upgrade. The effect of the N.R.A. action in providing codes for all industries seems to have a tendency to increase the cost of various items, and any increase must be included in the appropriation.

Included in the estimate is \$200,000 that is essential to keep up the repairs and necessary improvements to buildings and grounds. This is the same amount as authorized for 1933 and 1934. For the year 1935 this amount was reduced to \$175,000, due to the fact that funds were allocated to the hospital from the Public Works Administration for reconditioning purposes. Out of these repairs will come funds for keeping approximately 100 buildings in repair, repairing and widening roads and walks, the maintenance of railroad tracks, replacing glass, painting, etc.

The hospital has been growing so rapidly that it is still at a loss to provide the necessary beds, notwithstanding the additional buildings erected. There has just been completed the male receiving building, for 400 beds, and there is now under construction a female receiving building, for 300 beds. The hospital at the present time is overcrowded to the extent of about 900 beds. The increase each year is about 200 beds, so during the course of the next 2 years there will be a shortage of from 500 to 600 beds. Included in our estimates is an item for 4 continuous-treatment buildings at the rate of \$200,000 each, or a total of \$800,000. This will provide approximately 600 beds, and unless there is an unusual increase will permit us to provide a bed for each patient without overcrowding. This form of building would permit the construction at the rate of \$1,333 per bed, which is very low for a fireproof building. We believe we can erect these buildings and equip them with all necessary incidental expenses within the amount estimated.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS TO ST. ELIZABETHS HOSPITAL

We again recommend that a bill be introduced in the House of Representatives and in the Senate of the United States to change the method of admissions to St. Elizabeths Hospital. We believe that the best manner to have this bill introduced would be through the District Commissioners, the hospital cooperating in the drawing up and the presentation of the proposed bill. With this point in view the hospital has had several conferences with the Board of Public Welfare of the District, at which were present representatives of the corporation counsel's office, and the information furnished on the basis of additional legislation desired.

STAFF CHANGES JULY 1, 1933, TO JUNE 30, 1934

The following appointments were made during the year:

Junior medical officers (internes): Judah Marmor, Meyer Beber, Sidney Berman, Helen Yarnell, Alexander Wolf.

Visiting ophthalmologist: Francis C. Skilling.

The following resignations took effect during the year:

Junior medical officers (internes): E. Gaine Cannon, Myron M. Campbell, Frederick T. Zimmerman, Edward S. Post, Raoul L. Ramos, William L. Blair.

Assistant medical officers: Elsie Blanchard, J. Lester Henderson.

Director of laboratories: Walter Freeman.

Visiting ophthalmologist: Charles L. Billard.

PUBLICATIONS

White, William A., superintendent:

Some suggestions for the future. (Address at the eighty-ninth annual meeting of the American Psychiatric Association, Boston, Mass., May 29-June 2, 1933.) *The American Journal of Psychiatry*, vol. XIII, no. 2, September 1933, pp. 227-234.

Enlarging responsibilities for the physician. *The Journal of Nervous and Mental Disease*, vol. 79, no. 5, May 1934, pp. 497-504.

How three experts evaluate the Fairfield Plan—A comment on the plan of Connecticut's New Mental Hospital. *The Modern Hospital*, vol. XLII, no. 5, May 1934, p. 50.

O'Malley, Mary, clinical director:

Presidential Address, *Quarterly Bulletin of the Medical Women's National Association*, no. 41, July 1933, pp. 14-18.

Hall, Roscoe W., clinical director:

The Organization of Psychotherapy. *American Journal of Psychiatry*, vol. XIII, no. 3, November 1933, pp. 671-677.

(With Freeman, W. and Eldridge, Watson W.) Malaria Treatment of Dementia Paralytica. *The Southern Medical Journal*, vol. XXVII, no. 2, February 1934, pp. 122-126.

Eldridge, Watson W., internist and roentgenologist:

(With Hall, Roscoe W., and Freeman W.) Malaria Treatment of Dementia Paralytica. *The Southern Medical Journal*, vol. XXVII, no. 2, February 1934, pp. 122-126.

Lewis, Nolan D. C., director of laboratories:

Neuropsychiatric Aspects of Female Endocrinology. *Medical Annals of the District of Columbia*, vol. III, no. 4, April 1934, pp. 89-94.

Studies on Suicide, I., *Psychoanalytic Review*, vol. XX, no. 3, July 1933, pp. 241-273.

Studies on Suicide II., *Psychoanalytic Review*, vol. XXI, no. 2, 1934, pp. 146-153.

Freeman, Walter, director of laboratories:

Disorders of Muscle Tone and Their Localizing Significance. *New York State Journal of Medicine*, vol. 33, October 1, 1933, pp. 1133-1136.

(With Hall, Roscoe W., and Eldridge, Watson W.) Malaria Treatment of Dementia Paralytica. *The Southern Medical Journal*, vol. XXVII, no. 2, February 1934, pp. 122-126.

Murphy, John P. H., senior medical officer:

Accidents and Injuries; a Comparative Study of Their Causes among Various Groups. *Medical Annals of the District of Columbia*, vol. III, no. 1, January 1934, pp. 1-7.

Karpman, Benjamin, senior medical officer:

Psychic Impotence. *Psychoanalytic Review*, vol. XX, no. 3, July 1933, pp. 274-303.

Cohen, Roger S., associate medical officer:

The Mild Depressive Reactions. *Medical Annals of the District of Columbia*, vol. III, no. 6, June 1934, pp. 163-169.

Ashby, Winifred M., bacteriologist:

Standardization of the Lange Test. *Archives of Neurology and Psychiatry*, vol. 31, January 1934, pp. 154-160.

On the Relationship of the Dispersion of Gold Sol to the Intensity of Reduction as Influenced by pH, and a One-Way Effect Produced in Gold Chloride by Changes of pH through Certain Ranges. *Journal of Physical Chemistry*, vol. XXXVIII, no. 4, April 1934, pp. 427-447.

HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, President)

The year 1933-34 was the third of the 10 years involved in the program of development approved by the Government. The university continued to suffer from the depression though to a much slighter degree than during the previous year. Summer school, theological college, and correspondence courses, enrolling 394 students last year, were discontinued, but the total enrollment fell only 267 below the previous year. The university suffered further loss of income for current educational expenses from the Federal Government and from private sources, and there were further heavy curtailments of expenditures for materials and supplies and for educational and scientific equipment. The teaching staff was further reduced by 35 members. Teachers' salaries remained far below the average agreed upon by the Government and needed advances in rank were delayed for the third successive year. In order to meet the distressing needs of students the trustees devoted 7½ percent of all student fees to a special scholarship fund, reduced room and board, and established an installment plan of fee payments. The total budget, however, was kept at balance with a surplus of income over expenditures and the percentage relation between total Government funds and private funds was maintained with a variation of only 0.78 percent from the relation planned for the year 1933-34 in the 10-year program.

The university continued to receive help from the General Education Board, the Rockefeller Foundation, and Julius Rosenwald Fund for the development of the libraries, the further improvement of the teaching staff through fellowships, and for the extension of the university grounds. The program of land extension, financed by gifts from the General Education Board and the Julius Rosenwald Fund, drew to its close. The total land acquired, with improvements thereon, was valued at \$1,089,398.

The teaching staff continued to take encouraging advantage of sabbatical leave, scholarship, and fellowship privileges for self-improvement, more than one-ninth of the full-time staff being away for further study. Limited funds, however, did not permit substantial improvement in the maturity of the teaching staff, so that the number in the professorial rank still remained but little beyond half the number required for adequacy. Teachers were heartened by the

return of 5 percent of the prevailing 15 percent salary cut and by the trustee adoption of an improved retirement plan.

In spite of limited funds for research equipment and assistance, the teachers continued productive of scholarly activity, publishing or having accepted for publication 62 scholarly articles and 6 books. Publication of the *Journal of Negro Education* was also continued.

Through the use of specially appropriated Public Works and Civil Works funds the buildings and grounds of the university were extensively improved. The contract was let and work was well under way on a new classroom building, and the contract was let for a new chemistry building. Plans for a new heat, light, and power plant were practically ready for bids, and the plans and specifications for the new library were to be completed in August.

The semester system, on the whole, worked satisfactorily during its first year. The colleges of education and applied science closed their last year's work as separate colleges. Beginning July 1 the work in education passes into a department of the college of liberal arts, and the departments of art and home economics are transferred also from the college of applied science to the college of liberal arts. The work in civil, electrical, and mechanical engineering will thenceforth be done under the auspices of the school of engineering and architecture established by trustee action on January 8, 1934. Further trustee legislation formally organized the graduate school beginning July 1, 1934, and appointed a full-time graduate dean. The graduate school of religion went through its first year's work with a budget far below its needs. The venerable dean of the school retired and his successor was elected.

Throughout the university there was manifest increase of interest in artistic courses and activities, including music, the drama, and the plastic arts.

The first step was taken toward the introduction of a formal course for the training of dental hygienists, and the college of dentistry experienced a substantial increase in the new student enrollment (15) for the first time since the establishment of the new plan of instruction. The school of law, hitherto a probationary member of the American Association of Law Schools, was elected to full membership in that body, following a thorough official survey.

The need for advancing the maturity of the staff by a substantial increase in the number of competent teachers in the professorial rank is still primary and urgent. Increased scholarship funds are also imperative. The new library seems now assured, but there is great need for more books in every division of the university's work. Clark Hall, our present men's dormitory, and the old medical building, now used for dentistry, should be replaced as soon as possible, and the school of law ought to be moved to a point in proximity to the under-

graduate and graduate student activities, in a building with much greater floor space.

The registrar's unfinished collection of available addresses of the living Howard graduates shows 6,190 of them at work in 43 States and 24 foreign countries.

REGISTRATION

1. *Enrollment for the year 1933-34.*—At the opening of the school year 1933-34, Howard University operated on the semester system. The following table (table 1) shows the net total enrollment during the year, including the first and second semesters, and excluding duplicates, as compared with the summer, autumn, winter, and spring quarters of 1932-33.

Summary of students enrolled in Howard University for the years 1933-34 and 1932-33

Divisions of the university	Net enrollments							
	1933-34			1932-33			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	541	381	160	540	375	165	1	-----
College of education.....	379	83	296	523	113	410	-----	144
College of applied science.....	67	36	31	77	50	27	-----	10
School of music.....	49	21	28	41	16	25	8	-----
Graduate division.....	164	66	98	170	83	87	-----	6
Total.....	1, 200	587	613	1, 351	637	714	9	160
Professional schools:								
Theological college.....	21	20	1	40	32	8	-----	19
Graduate school of theology.....	11	11	0	10	10	0	1	-----
Law school.....	37	37	0	44	44	0	-----	7
School of medicine:								
College of medicine.....	203	196	7	206	200	6	-----	3
College of dentistry.....	29	38	1	38	37	1	1	-----
College of pharmacy.....	22	19	3	24	22	2	-----	2
Total in professional schools.....	333	321	12	362	345	17	2	31
Total in regular courses.....	1, 533	908	625	1, 713	982	731	11	191
Special students in music, law, dentistry.....	93	31	62	96	30	66	-----	3
Correspondence students (religion).....	0	0	0	84	82	2	-----	84
Total special students.....	93	31	62	180	112	68	-----	87
Grand total (net).....	1, 626	939	687	1, 893	1, 094	799	11	278

This table shows that the total enrollment for the year 1933-34 was 1,626, of whom 939 were men and 687 were women, as compared with the total of 1,893 for 1932-33, of whom 1,094 were men and 799 were women. A net loss of 267 students, or 14 percent, is indicated, as compared with the net loss of 571, or approximately 23 percent, for the preceding year. This loss was mainly due to the discontinuance of the summer school and the theological college and correspondence courses, which together registered 394 students in 1932-33.

There was a loss of only 39 in the group of entering students. In this loss the to-be-discontinued college of education led with 32. Liberal arts, music, dentistry, and pharmacy registered gains in the new student group of 9, 3, 15, and 4, respectively. In the net loss of 39 students 32 were women. Only 3 new women students registered in the professional schools and colleges.

2. *Geographical distribution.*—Thirty-eight States sent 1,423 candidates for degrees in 1933–34 as compared with 40 States sending 1,590 candidates in 1932–33. Fourteen of these States sent increased enrollment of from 1 to 9 students. Four States sent 10 or more candidates for degrees. The percentage of students coming from the District of Columbia was 30.1 percent as compared with 31.3 percent for 1932–33.

Fourteen foreign countries sent 110 candidates for degrees during the school year 1933–34, as compared with 17 foreign countries, with a total of 123 candidates for degrees in 1932–33. The largest group of foreign students (79) came from the British West Indies. Four came from the Virgin Islands, two of whom were receiving liberal scholarships from Howard University.

3. *The scholarship of entering students.*—During the year the registrar of the university made a careful study of the records of 1,082 new students entering the undergraduate colleges during the 5-year period, 1928–33. He found that 282, or 26 percent, made records of B (above average) and above; 486, or approximately 45 percent, made the record of C or C plus (average records); while 314, or 29 percent, made records below C (below average). Of this last group 159, or 15 percent of the entire group, made records which caused them to be dropped for poor scholarship, while 155, or 14 percent of the entire group, were able to continue their work at the university.

4. *Widening support of the secondary schools.*—During the school year 1932–33, 123 secondary schools sent 334 new students to Howard University. During the school year 1933–34 the 306 new students came from 147 secondary schools—an increase of 24 schools, or 19.6 percent.

5. *Growth in students of advanced standing.*—During the school year 1933–34, 54 students entered the undergraduate colleges with advanced standing from 33 institutions, as compared with 22 such students from 14 institutions in 1932–33.

Fifty-three out of 92, or approximately 58 percent of the new students entering the professional schools last year, were equipped with 4 years or more of previous college training. Of the 1,626 students in the entire institution 360, or 22.1 percent, were persons holding one or more academic degrees.

6. *Scholarships and student aid.*—At the beginning of the school year the trustees of the university set aside 7½ percent of all student fees

as a special scholarship fund for needy students. They also made special provision for increased work opportunities for students, reduced the price of room and board, and provided an installment system of fee payments. These plans were strengthened in the second semester by the special aid extended to students throughout the Nation by the Federal Emergency Relief Administration. By these combined measures 247 students were helped in the undergraduate colleges, and approximately 17½ percent of the professional students were also given aid during one or more semesters.

All scholarships and student aid were awarded to needy students in the order of excellence in scholastic standing. Support was thereby given to all other measures stimulating earnest scholarly work. These student-aid measures were far from adequate, however. Many worthy students, desiring to enter, could not be helped at all. Many who came were able to remain for one semester only, while others were able to take only a half or a third of a normal student load. Some clung to their ambition against apparently insuperable difficulties. A wider extension of scholarship aid is imperative.

GRADUATES

In 1933-34 a total of 231 students were graduated. This number represents a decrease of 88 from the group of graduates in 1932-33, indexing the effect of the depression in the 4 previous years. The reduced graduation numbers were shared by all divisions of the university with the exception of the colleges of applied science and medicine, which shared gains of 2 and 5, respectively. The following table shows the distribution of the graduates by divisions and by sex.

Summary of students graduated by Howard University for the years 1933-34 and 1932-33

Divisions of the university	Graduates						Total gain	Total loss
	1933-34			1932-33				
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	51	28	23	64	44	20	-----	13
College of education.....	71	11	60	122	26	96	-----	51
College of applied science.....	9	8	1	7	3	4	2	-----
School of music.....	2	0	2	4	1	3	-----	2
Graduate division.....	29	14	15	34	16	18	-----	5
Total.....	162	61	101	231	90	141	2	71
Professional schools:								
Theological college.....	6	6	-----	7	3	4	-----	1
Graduate school of theology.....	1	1	-----	3	3	-----	-----	2
Law school.....	7	7	-----	8	8	-----	-----	1
School of medicine:								
College of medicine.....	47	46	1	42	42	-----	5	-----
College of dentistry.....	6	6	-----	18	17	1	-----	12
College of pharmacy.....	2	2	-----	10	9	1	-----	8
Total in professional schools..	69	68	1	88	82	6	5	24
Grand total.....	231	129	102	319	172	147	7	95

Of the 29 students who received degrees from the graduate division, 19 were awarded the degree of master of arts, while 10 received the degree of master of science. Of the 51 graduates in liberal arts, 26 received the degree of bachelor of arts, 20 the degree of bachelor of science, and 5 the degree of bachelor of science in commerce. Of the 71 graduates in the college of education, 57 received the degree of bachelor of science in education. Of the 9 graduates in applied science, 3 received the degree of bachelor of science in civil engineering, 3 the degree of bachelor of science in electrical engineering, 1 the degree of bachelor of science in home economics, and 2 the degree of bachelor of science in mechanical engineering. One graduate received the degree of bachelor of music and 1 the degree of bachelor of school music.

In the professional schools 47 graduates received the degree of doctor of medicine, 6 the degree of doctor of dental surgery, and 2 the degree of doctor of pharmaceutical chemistry. In the school of law 7 degrees of bachelor of laws were conferred, while the school of religion awarded to 1 the bachelor of divinity degree and to 6 the bachelor of theology degree.

Honorary degrees.—No honorary degrees were conferred at commencement in June 1934.

Distribution of living graduates.—During the last 3 years the registrar of the university has been endeavoring to secure addresses of all living graduates of Howard University. Thus far he has succeeded in getting 6,191 out of a total of 8,941. Of this group 6,059 are found to be at work in 42 States and the District of Columbia, and 132 at work in 24 foreign countries. It is estimated that approximately 1,000 graduates are deceased while 1,650 addresses of the living remain to be secured.

TEACHING STAFF

1. *Number of teachers.*—There were 237 members of the teaching staff during the year 1933–34, of whom 135 were on full time and 102 were on part time, representing together a full-time equivalent of approximately 154 teachers, as compared with a total of 265 members of the teaching staff during the year 1932–33, of whom 153 were on full time and 122 were on part time, representing together a full-time equivalent of 174½ teachers. This represents a reduction of 38 in the faculty of 1933–34, as compared with the faculty of 1932–33, 18 of whom were full-time teachers.

2. *Improvement of staff.*—The teachers continued their work of self-improvement through further study. Twelve of them were on leave of absence or under fellowship privileges with contract to accept appointment at Howard University. Of the 12 away, 6 were from the college of liberal arts, 1 from education, 2 from music, and 3 from medicine.

During the period of 5 years expiring 1933-34, the university has enjoyed two special grants for the further training of teachers, 1 from the Rockefeller Foundation for the further training of teachers in medicine and 1 from the General Education Board for the further training of teachers in the natural sciences. The use of the Rockefeller Foundation grant has enabled the university to reconstruct the entire work of the preclinical branches of medicine through the training and employment of men of superior ability in every department. The General Education Board grant has been of invaluable assistance in building up the departments of chemistry, zoology, mathematics, and physics. These special grants have been accompanied by annual grants from the Julius Rosenwald Fund and the General Education Board which, supplementing the university sabbatical-leave privilege, have made possible increased educational opportunity for teachers in the majority of the departments of liberal arts, education, and music.

3. *Maturity of the staff.*—Of the 154 full-time and full-time-equivalent teachers on the staff of Howard University during the current year 35, or 22.7 percent, were professors; 25, or 16.2 percent, were associate professors; 32, or 20.8 percent, were assistant professors, while 62, or 40.3 percent, were in the rank of instructors and below. On the basis of the 10-year program of development which calls for a percentage distribution in the four leading ranks of 40, 10, 20, and 30 percent, the present staff (full-time and full-time-equivalent) should have a distribution as follows: 62 professors, 15 associate professors, 31 assistant professors, and 46 instructors. The university has yet about half-way to go in the development of a staff of mature professors. Examination of university salaries confirms this judgment. The university is spending approximately \$175,000 less in salaries than would be necessary to obtain and hold the services of a sufficient number of mature professors. The securing of 27 capable scholars for important positions on the professorial staff of the university is the outstanding educational need. All other improvements are subsidiary to and wait upon this for their fullest effectiveness.

4. *Salaries of teachers.*—The salaries of teachers at Howard University remained as at last year, with the exception that 5 percent of the prevailing 15-percent cut was restored during the second semester. In setting up the 10-year program of development for Howard University the Government agreed upon a definite salary scale for teachers. The salary cuts struck the teachers before even the minimum salaries in this scale could be uniformly established. The result is that during the year 1933-34, 78 of the 135 full-time members of the teaching staff were receiving actual salaries below the minimum for their rank agreed upon by the Government in the 10-year program, 49 others received salaries slightly above minimum but below the average, while only 8, or less than 6 percent, received a salary at or above the agreed-upon average.

Under these circumstances it appears imperative that the full amount of the prevailing salary cut shall be restored at the earliest possible moment and that additional funds be secured to enable Howard University to improve the salary offerings to its teachers.

5. *Retirement legislation.*—On April 10, 1934, the trustees of the university adopted new retirement legislation, effective July 1, 1934, replacing temporary arrangements in effect since June 7, 1927. The new legislation sets the compulsory retirement age at 65 and provides that an officer or teacher in the service of the university for 20 years at the time of retirement may receive deferred annuities reaching as high as one-half of the annual salary on condition that the officer or teacher pay monthly premiums of 5 percent of current salary to be supplemented by a further 5 percent paid by the university to the Teachers Insurance & Annuity Association of America. Special provisions are made whereby officers and teachers now over 45 may be guaranteed an annuity on retirement equal to one-third the basic salary for 1933–34, whereby officers and teachers not in the service for 20 years may receive certain annuities with the help of the university, and whereby employees of the university other than officers and teachers may, upon application, secure the cooperation of the university to the extent of 5 percent of the annual salary toward a deferred-annuity allowance.

GRADUATE DIVISION

1. *Student enrollment.*—During the year 1933–34 there were 164 graduates in residence in Howard University, including 66 men and 98 women, 106 of whom were registered as pursuing graduate degrees in 18 departments of the graduate division.

2. *Degrees awarded.*—The number of students who received advanced degrees in 1933–34 was 29 as compared with 34 in 1932–33, 18 in 1931–32, and 13 in the year 1929–30—the highest preceding peak years. Of the 29 degrees awarded, 19 were masters of arts, awarded to 7 men and 12 women; and 10 were masters of science, awarded to 7 men and 3 women. Five of the degrees were awarded in chemistry, 3 in education, 6 in English, 1 in French, 2 in German, 6 in history, 1 in mathematics, 2 in physics, 1 in political science, and 2 in psychology.

3. *Teaching staff.*—The teaching staff of the graduate division during the school year 1933–34 included 47 members as compared with 48 members in the year 1932–33. Of this number 17 were professors, 13 associate professors, 13 assistant professors, and 4 instructors. Thirty-six of the teachers were from the faculty of the college of liberal arts, 7 from the faculty of education, and 2 from the faculty of the school of religion.

4. *Research and publication.*—The head of the department of zoology is continuing his research in the Marine Biological Laboratory

in Naples, Italy, under sabbatical leave. Other research was continued but severely restricted on account of lack of funds. Teachers and officers published and had accepted for publication 6 books and 62 scholarly articles.

5. *The future of graduate work.*—The year 1933–34 brought to an end the 7-year experiment with a graduate division of the university, under the control of a committee of instruction appointed by the president of the university from among the several faculties. Beginning with the school year 1934–35, graduate instruction will be carried forward in a separate graduate school presided over by a dean already appointed.

The formal organization of the graduate school on the basis of assured need emphasizes the necessity of the earliest possible advancement of all those phases of university life which may assure the competence of this work: (1) The securing of an increased number of mature scholars in the professorial rank, with salaries enabling them to devote their full time to their work; (2) the development of a substantial number of graduate scholarships and fellowships for the encouragement of advanced students; (3) the rapid advancement of book collections in every department offering graduate work.

COLLEGE OF LIBERAL ARTS

1. *General trends.*—During the year 1933–34 the college of liberal arts sustained its enrollment and registered a gain of 1, but the number of degrees awarded showed a drop of 9, giving index to the depression losses in former years. Progress was made toward group organization of the faculties and the mortality in freshman English classes was greatly reduced through the sectioning of freshman English classes on the basis of ability determined by preliminary tests. A faculty committee on the improvement of instruction engaged in the preparation of legislation looking toward this end. The construction of the new chemistry and classroom buildings offered early prospect of great improvement in equipment.

At the beginning of 1934–35 this college will absorb the entire work of the college of education in a department of education, and it will also take over the work of the departments of art and home economics hitherto organized in the college of applied science. It is expected that this change will double the number of students registered in the college of liberal arts, increasing the administrative responsibility to that extent. The size of classes and teaching loads of individual instructors in liberal arts, however, will not be much changed.

2. *Students.*—The college of liberal arts enrolled 541 students during the year 1933–34, 381 of whom were men and 160 were women. This represents an increase of 1 over the enrollment of 1932–33.

Students in this college were greatly helped by the special scholarship and student-aid plans of the trustees and by the supplementary student aid coming from the Federal Emergency Relief Administration in the second semester.

3. *Graduates*.—The college of liberal arts awarded 51 degrees in the year 1933–34, a net loss of 9 in comparison with the preceding year. Of these 51 graduates, 26 received the degree of bachelor of arts, 20 the degree of bachelor of science, and 5 the degree of bachelor of science in commerce.

4. *Teaching staff*.—There were 69 members of the faculty of the college of liberal arts during the academic year 1933–34, 63 of whom were full-time teachers and 6 part-time, representing together a full-time equivalent of 64½ teachers. This marks a loss of 14 teachers, 13 of whom were full-time and 1 part-time. The 69 teachers for the year were distributed as follows: Professors, 19 (17 full-time and 2 part-time); associate professors, 12; assistant professors, 15 (14 full-time and 1 part-time); instructors, 18 (16 full-time and 2 part-time); assistants, 5 (4 full-time and 1 part-time). During the academic year 7 teachers returned from leave of absence for further study, while 5 were away for the same purpose. There were three appointments during the year. Two teachers retired for age, and two members of the staff were taken by death.

Members of this faculty published 27 articles and 1 book during the year. It is to be hoped that an early return of normal conditions will permit the reappointment of native teachers in German and Spanish and the addition of one member each to the departments of political science, romance languages, sociology, and physical education for women.

5. *Special grants from General Education Board*.—The year 1933–34 was the fifth and last year of the privileged use of two special 5-year grants from the General Education Board—one for \$29,000 for the further training of teachers in the natural sciences and another of \$28,000 for the further development of libraries of the natural sciences. Twelve thousand dollars of the grant for the libraries was used in 1929–30 and \$4,000 in each of the 4 succeeding years, for the purchase of greatly needed books in chemistry, physics, zoology, botany, and mathematics. This grant enabled the establishment and initial development of departmental libraries in each case and greatly strengthened the work. Of the grant for the further training of teachers in the natural sciences the University was able to use \$21,250 during the 5-year period in aid of more than 13 years of further study for 9 teachers in chemistry, zoology, physics, and mathematics.

COLLEGE OF EDUCATION

1. *The discontinuation of the college of education.*—The college of education ceases its existence as one of the units of the University on June 30, 1934, as the result of the action of the board of trustees taken at its April meeting 1933. Thenceforth the work of education will be done by the same faculty group in a department of education in the college of liberal arts.

2. *Enrollment.*—The enrollment of the college of education in 1933–34 was 379, representing a drop of approximately 27.5 percent from the enrollment of 523 in 1932–33. The discontinuance of the summer school, largely recruited from teachers, and the announced integration of the work in education with the college of liberal arts, as well as the depression conditions referred to in the last report, contributed to this loss.

3. *Practice teaching.*—During the year 58 student-teachers worked at practice teaching in 10 public schools of the District of Columbia, and taught 14 subjects as their majors in fulfillment of requirements for graduation. We are grateful to record that this privilege has been extended to our students for the past 14 years.

4. *Graduates.*—In 1933–34 there were 71 graduates of the college of education. Fifty-seven degrees of bachelor of arts and 14 degrees of bachelor of science in education were awarded. Of the 29 graduate degrees awarded during the year 3 were in the field of education.

5. *Faculty.*—The teaching of courses in education was done by 9 full-time teachers, including the dean, and 5 part-time teachers whose major assignments were in other departments. The 2 teachers on leave last year resumed their duties and 2 received the degree of doctor of philosophy from Columbia University during the year. The 9 members of the group published, during 1933–34, 2 books, 8 magazine articles, and 6 book reviews, and completed the second volume of the journal of Negro education which closed with a notable year-book number of 564 pages on "The Physical and Mental Abilities of the American Negro." The number contains 18 pages of carefully selected bibliographical material on this subject which is stated by the editor to "constitute the most comprehensive and up-to-date single source on this topic that can be found in print at this time."

COLLEGE OF APPLIED SCIENCE

1. *Organization and curricula.*—During the school year 1933–34 the college of applied science offered six curricula in four major departments, as follows: Architecture, art, home economics, and engineering—including civil engineering, electrical engineering, and mechanical engineering. The board of trustees voted to discontinue the college of applied science at the end of 1933–34 and in its stead to estab-

lish the school of engineering and architecture, a separately organized and administered higher educational unit, with a dean at its head. The present acting dean of the college of applied science has been appointed acting dean of this new school. The departments of art and home economics are to be merged with the college of liberal arts. Until such time as graduate instruction may be offered by the school of engineering and architecture, the school will follow the policy of directing certain of its graduates to other institutions for advanced work. No new departments will be added to the school at the present time.

2. *Enrollment.*—During the year 153 individual students pursued courses in this college as compared with 177 during the previous year. Sixty-five of these students enrolled for degrees offered by the college of applied science, equaling in number the 65 students of the school year 1932–33.

3. *Scholarships.*—Eleven scholarships, including six Federal Emergency Relief Administration work scholarships, were made available to students of the college of applied science during the school year. This represents an increase of eight scholarships over the number available during the preceding school year.

4. *Graduates.*—The college of applied science awarded 9 degrees in the year 1933–34, as compared with 8 degrees during 1932–33. The 9 degrees awarded were as follows: Bachelor of science in civil engineering, 3; bachelor of science in electrical engineering, 3; bachelor of science in mechanical engineering, 2; bachelor of science in home economics, 1.

5. *Teaching staff.*—In 1933–34 there were 15 full-time and 1 part-time teachers. One faculty member returned from leave of absence and one earned the degree of doctor of philosophy during the year. One instructor was granted sabbatical leave for the school year 1934–35. A member of the faculty was appointed architect to the Division of Subsistence Homesteads. Three members of art department staff contributed their works to current exhibitions of art, including the annual water color exhibition at the Philadelphia Academy of Fine Arts, the Negro artists' exhibition sponsored by the College Art Association and the Harmon Foundation, and the Negro artists' exhibition at the National Galleries, Washington, D.C., sponsored by the Association for the Study of Negro Life and History.

6. *Contributions to the community in adult education.*—Through the activities of the departments of this college there were several contributions to current community life, especially along the line of adult education. The university's service was extended to civic groups and associations on such topics as consumers' education, art appreciation, clothing economics, and special informal short course

lectures on building construction. This work was closely related to the general program of the college which included exhibitions of works of art, exhibitions of fitness, beauty and economy in dress, architectural exhibitions, and the engineering laboratories' "open house."

The art department provided 10 exhibitions of art, including 2 on African art, and 8 lectures including 1 on the Bushmen Painters and 1 on Negro art. The art exhibits were attended by 9,581 persons. By loan from the Government to Howard University the department of art acquired the possession and use of 11 works painted by Negro artists in connection with the Public Works art project.

SCHOOL OF MUSIC

1. *Enrollment.*—The enrollment of the school of music again showed an increase in 1933-34, in a general trend of increased music enrollment over a period of 5 years, beginning with 78 students in 1929-30. There was an average enrollment of 140 during the current year, with 28 new matriculants in the first semester and 12 in the second.

2. *Beneficial scholarships.*—Eighteen students in the school received scholarship aid during the year from four sources: Seven special university scholarships of \$150; gift scholarships from the school of music faculty and the musical arts society, \$186.85; and work scholarships through the university and the Federal Emergency Relief Administration. These scholarships were very helpful to the registration, scholarship, and morale of the school.

3. *Courses and faculty.*—Courses were offered in piano by 3 teachers; in organ by 1 teacher; in voice by 2 teachers; in violin, orchestration, string and percussion instruments by 1 teacher; in public-school methods by 1 teacher; in theory and appreciation of music by 2 teachers; and in the junior piano department by 3 teachers. The total faculty of 9 included 2 professors, 1 assistant professor, 5 instructors, and 1 assistant. Two members of the faculty were away on sabbatical leave for further study. Representative recitals were given during the year by four members of the faculty in four States and the District of Columbia. Monthly recitals were given in the recital hall by all advanced students of the school of music, including this year the departments of voice, violin, and piano, with representation from the junior piano classes. At the end of the year the work of the school found expression in formal recitals in the university chapel.

4. *Musical organizations.*—Students of the school of music found avenues of expression and service through four musical organizations: The University choir, the University glee club for men, the women's glee club, and the musical arts society.

5. *University concert series.*—During the year the Howard University concert series, maintained to feed and develop the cultural appreciation of music, was continued under the auspices of the school of music. One singer, two pianists, one violinist, one glee club, and the National Symphony Orchestra of Washington were presented with such a cordial response from students, faculty, and citizens that all bills were paid with a substantial cash balance remaining toward the budget of the coming year. The warm appreciation of this musical series, considered in relation to the wide-spread interest in the art exhibits and in the student dramatic presentations in the department of English in the college of liberal arts, indicates an encouraging growth of interest in the arts throughout the University.

6. *Graduates.*—Two degrees were conferred at commencement: The bachelor of music degree to one student with a major in organ, and the bachelor of school music degree to one student specializing in public-school music.

7. *Organ.*—The trustees have placed the school of music in position to acquire an organ. This instrument will complete the range of equipment for the school and will enrich its work in many ways. The faculty rejoices.

MILITARY SCIENCE AND TACTICS

1. *Headquarters' appraisal of the work.*—Under date of June 11, 1934, the acting chief of staff, Headquarters Third Corps Area of the United States Army, transmitted a letter expressing the gratification of the headquarters over "the excellent results attained by the unit, as shown by the report of inspection recently completed at your institution", and quoted from the report of inspection signed by command of Brigadier General Tracy:

All indications point to a better unit at Howard University. Tremendous strides toward improvement have been accomplished during the past year.

There is marked improvement in the efficiency of this unit which, in my opinion, deserves special mention in this report.

General rating of the unit: Excellent.

2. *Enrollment.*—The enrollment in military science and tactics during the year 1933-34 was 266 during the first semester, and 246 during the second semester, with an average for the year of 256.

3. *Commissions awarded.*—Twenty students were awarded commissions as second lieutenants of infantry, in the Reserve Officers' Training Corps of the United States Army.

4. *Teaching staff.*—The teaching staff of military science and tactics includes 5 members as follows: Professors, 1; assistant professors, 1; assistants, 3.

SUMMER SCHOOL

There was no summer school during the year 1933-34, in accordance with the legislation of the board of trustees providing that beginning with the school year 1933-34 the summer school shall be discontinued. Enrollment of the last session of this school during 1932-33 was 291.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the University without superseding the direct lines of authority from the independent faculties of its member units to the board of trustees. Freedmen's Hospital, an independent institution built upon grounds owned by the University, is functionally a part of the University medical unit.

THE COLLEGE OF MEDICINE

1. *General trends.*—The main objectives for the year have been: (1) To hold the ground already gained educationally in face of serious budget reductions; (2) to improve cooperation among the departments of instruction in the school and between the school and the Freedmen's Hospital; and (3) to keep students from becoming discouraged and withdrawing from school on account of lack of funds. During the year surveys of the school were made by the State boards of Massachusetts and Pennsylvania. A survey by the State of Illinois is now in progress. The council on medical education has announced its plan to make another survey of all the medical schools in the United States. In this forthcoming survey emphasis will be placed on the quality of teaching personnel, the adequacy of scientific equipment, apparatus, and supplies, and upon the availability of a teaching hospital under proper educational control.

2. *Students.*—Of a total of 201 applicants for admission, 137 satisfied the minimum requirements. Forty-eight new students were admitted to the freshman class. One hundred and ninety-nine students were registered in the first trimester, 198 for the second, and 195 for the third. Twenty-four of those admitted held the bachelor's degree, 1 the master's degree, while all the others presented credit for at least 3 years of approved college work. Eight students withdrew during the year but only 3 of these on account of lack of funds. In no case, however, has a medical student with demonstrated ability and of scholastic advancement well above the average been compelled to withdraw on account of lack of funds. The small-payment plan adopted by the University prevented many students from withdrawing on account of inability to pay their way. The scholarship-aid plan instituted last year has amply justified itself. In accordance with this plan 8 full tuition scholarships and 8 half tuition scholar-

ships were awarded to medical students. Eighteen other students were aided by the Federal Emergency Relief Administration.

3. *Graduates*.—Forty-seven graduated with the degree of doctor of medicine. Forty-six of these accepted general rotating internships in 13 hospitals.

4. *Faculty*.—Two full-time appointments to instructorships were made, one in bacteriology and 1 (a former general education board fellow) in neurology and psychiatry. Of a faculty of 97, 17 were full-time teachers as compared with a faculty of 62 in 1929-30, with 3 nominally full-time teachers. Two general education board fellows, 1 in public health and the other in neuroanatomy, have completed their second year of study at the University of Michigan. One of them received the degree of doctor of public health and the other the degree of doctor of philosophy. Their appointments as full-time members of the faculty became effective July 1, 1933-34. One instructor has been granted a fellowship by the Oberlaender Trust for the purpose of advanced study in dermatology and syphilology in Berlin, Germany. One part-time professor was retired after many years of faithful service. There have been 8 scientific publications by members of the faculties and 6 other publications are in the press.

In the absence of budgeted money for travel 8 members of the faculty attended national scientific societies at their own expense. Two represented Howard University by reading scientific papers, resulting from their research, before the Federation of American Societies of Experimental Biologists, the American Society of Physical Anthropologists and the American Society of Mammologists. Three teachers were elected to membership in national scientific societies.

5. *Instruction*.—Although some teachers continue to work without adequate help and equipment there has been surprisingly little serious complaint. Instruction has been furnished to medical, dental, pharmaceutical students, and also to a few from the other colleges, including 16 student nurses in anatomy and to 14 in bacteriology.

6. *Departmental, interschool, and hospital relations*.—Increasing cooperation is noted among the departments of the school, and a very satisfactory series of interchanging lectures has been conducted between the medical and dental colleges and the law school on fields of mutual interest. The relations between the school and hospital remain cordial. On some services in the hospital the clinical material for teaching purposes is adequate in quantity and variety, while in others it is not. Particularly is there a lack of ample clinical material for teaching pediatrics. Facilities for practical teaching of tuberculosis and acute contagious diseases is still lacking. This material should be provided for in the Freedmen's Hospital group.

COLLEGE OF DENTISTRY

1. *Enrollment*.—Thirty-nine students were registered in the college of dentistry during the school year 1933–34, representing an increase of 1 over the 38 enrolled in 1932–33. There was, however, an increase of 15 in the enrollment of the freshman class, representing the first substantial increase of new students since the college adopted the plan of instruction which requires 2 years of college work for entrance and 4 of professional work for graduation. Two of the new students entered with the bachelor's degree. Several others are pursuing continuation courses leading to both baccalaureate and dental degrees.

3. *Graduates*.—Six graduating students were awarded the degree of doctor of dental surgery at the June commencement. Two former graduates returned during the year for postgraduate work.

4. *Curriculum*.—Official announcement was made of the inauguration of a formal course for the training of dental hygienists during the school year 1934–35 and the first faculty appointment was made looking in this direction. In view of limited facilities and teaching personnel the first class will be limited to 10 students. Qualified applicants already exceed this number.

5. *Faculty*.—The teaching staff continued to include 14 members in 1933–34, 11 of whom were on full-time and 4 on part-time, together representing a full-time equivalent of $12\frac{1}{2}$ teachers. But before the close of the year the staff was weakened by the death of Dr. Frederick P. Barrier, associate professor, a faithful member of the faculty for 28 years. Long-delayed advancement in rank and salaries kept the staff predominantly composed of men in the instructor's rank, the distribution being as follows: Professors, none; associate professors, 3; assistant professors, 1; instructors, 10. (7 full-time and 3 part-time).

Scientific papers, resulting from the research of the dean of the college, were read before the American Association for the Advancement of Science and the International Association of Dental Research, abstracts appearing in 2 scientific journals.

6. *Physical plant*.—Numerous handicaps and inconveniences in connection with the old medical building now used for dentistry have continued to cause the efficiency of the organization to suffer. During the year some progress was made toward overcoming these by a renovation project financed by the Public Works Administration. At the close of the year, however, this project was incomplete. The age and general condition of this building will not permit the best modern work in dentistry to be done in it. The cause of dental education will be greatly served when an urgently needed building with modern equipment is made available.

COLLEGE OF PHARMACY

1. *Registration.*—Twenty-two students registered in the college of pharmacy; 9 in the first year and 4 in the second year of the 4-year course; 2 in the junior and 7 in the senior years of the 3-year course.

2. *Graduates.*—Two students graduated from the 3-year course with the degree of pharmaceutical chemist. The other 7 students, still pursuing the 3-year course—2 juniors and 5 seniors—had not completed the work, but must do so by 1936, the last year for conferring pharmaceutical chemist degree.

3. *Faculty.*—The teaching staff of five members remained the same for 1933-34 as 1932-33. There were 2 full-time professors, 1 of whom is vice-dean, 1 associate professor, 1 full-time instructor, and 1 part-time (one-fourth) instructor. Two scientific papers were published by faculty members during the past year, both in the Journal of the American Pharmaceutical Association.

4. *Curriculum.*—The 4-year curriculum leading to the degree of bachelor of science in pharmacy has been revised to conform to the new National Pharmaceutical Syllabus which is official for all boards and colleges of pharmacy.

5. *Equipment.*—On account of the curtailed budget very little equipment was acquired during the year. Reconstruction of lecture rooms, laboratories, supply rooms, and offices by the maintenance department has added greatly to the teaching facilities of the college.

SCHOOL OF LAW

1. *General trends.*—After a favorable report by the examiner of the American Association of Law Schools the school of law at Howard University was elected to full membership in the association, thus ending its probationary period. The school also acquired membership in the Association of Law Libraries through the activity of the acting librarian, and entered into the plan of this organization to operate a law library clearing house for the exchange of duplicate books. The enrollment experienced a further decline and there was a further loss in faculty personnel. The average scholarship of students increased in caliber; the library gained 824 volumes, making a total of 15,237 volumes, thus further crowding the already outgrown space of the school. The trustees voted to move the school to the undergraduate and graduate campus as soon as building space can be available.

2. *Enrollment.*—The total enrollment of the year was 38, as compared with 44 in 1932-33, the decrease being due to the following special factors: (1) the elimination of the part-time school, (2) the marked increase in standards of scholarship, (3) the elimination of 50 percent of the colleges from which students may be accepted, and (4) the acute economic depression among Negroes.

During the year the administration of the school of law made a survey of interest in legal education in 17 of the schools whose students are eligible for admission. It was found that interest is increasing. The administration believes, therefore, that the decline in enrollment has reached its lowest level and that from now on increase will be noted. A new ruling of the accrediting organizations has also increased the number of schools from which students may be admitted.

3. *Graduates*.—Seven graduates received the degree of bachelor of laws in June, as compared with eight for the previous year.

4. *Faculty*.—The faculty of the school of law for 1934 included 11 members, 4 of whom were full-time and 7 of whom were on part-time, together making a full-time equivalent of 5½ teachers, distributed as follows: Professors, 4 (2 full-time and 2 part-time); associate professors, 1; assistant professors, 3 (1 full-time and 2 part-time); instructors, 1 (part-time); others, 2 (part-time). Two teachers returned from further study on fellowships at Harvard University, after having earned the degree of doctor of juridical science. One teacher will be away on fellowship at Harvard during the coming year.

RELIGION

1. *Support*.—The school of religion receives no aid from Government appropriation. It is entirely supported from a small endowment and from private gifts.

2. *Organization and curriculum*.—In accord with the previous trustee action the correspondence, evening school, and college of religion courses were discontinued at the beginning of the school year 1933-34, and the school operated solely as a graduate school of religion requiring a bachelor's degree from a standard college for entrance. The 21 students who had already begun their course in the college of religion were permitted to continue their work, but no new students were admitted to this course.

3. *Students*.—The total enrollment for the year was 32, with 11 students registering in the graduate school of religion and 21 continuing their courses in the college of religion.

4. *Faculty*.—The work was conducted by 10 teachers—2 full-time professors, 1 full-time associate professor, and 7 part-time instructors, together representing the full-time equivalent of 5½ teachers. One full-time instructor resigned at the end of the first semester to enter the pastorate. At the end of the year the venerable dean of the school of religion retired after a lifetime of service in the field of Negro education, and his successor was elected.

5. *Extension work*.—During the year the faculty conducted the annual convocation for 3 days, the institute for ministers and religious

workers at Kinston, N. C., for 5 days, and 2 teacher-training classes for the Sunday-school teachers of Washington.

6. *Graduates*.—Seven men were graduated in June, one with the bachelor of divinity degree and six with the degree of bachelor of theology.

THE LIBRARIES

1. *Accessions to the book and periodical collections*.—During the year there were 6,930 accessions to the book collection, distributed as follows: General library 5,845, law 824, medicine 261. These accessions included gifts from 36 donors, many of which were very valuable.

The total usable book collection of the university now includes 85,020 volumes exclusive of pamphlets estimated at 35,000, and of the Veterans' Bureau collection, distributed as follows: Medicine 7,528, law 15,235, general library and all other branches, 62,257.

The libraries subscribe for 498 periodicals distributed as follows: Main library 335, medical library 138, law library 25. Two hundred and eighty-one volumes of back issues of periodicals for the departments of the natural sciences were purchased during the year. Five hundred and thirteen volumes of periodicals were bound during the year, including 380 volumes in the main library and 133 in medicine. The main library now has 5,000 volumes of bound periodicals.

2. *Special Negro collections*.—Valuable additions were made during the year to the Moorland Foundation, a special collection of books by and about Negroes. This collection now contains 4,400 books, about 3,000 pamphlets, and 283 bound periodicals. Forty-three volumes of periodicals pertaining to the Negro were bound during the year. There were 15 loans to college and university libraries from this collection during the year.

In 1932-33 the medical library began a collection of reprints of outstanding scientific publications by Negroes in the field of medicine. This unique and valuable collection is growing at a rate far greater than was expected. It received two especially encouraging gifts during the year.

3. *Cataloging*.—Six thousand nine hundred and eighteen volumes were cataloged during the year in the main library and 147 volumes were recataloged.

4. *Circulation*.—In the main library there was a total circulation of 42,922 books during the year, including 844 reserved books, representing an average of 256 books per day. In the medical library there was a total circulation of 35,414 books for the year or an average per day of 118. Three hundred seventy-seven inter-library loans were made in the general library and 100 in the medical library.

5. *Loans from Veterans' Bureau collection.*—The university received 46 requests for loans from the Veterans' Bureau books made available to Howard University and loans were made to 41 institutions, totaling 29,000 books.

6. *Improvements in organization and service.*—The main library was organized during the year into four divisions: (1) Cataloging, (2) reference and circulation, (3) order and acquisitions, and (4) special Negro collection. This resulted in decided improvements in service and in *esprit de corps*. Work was greatly facilitated also by increased student assistants made available through special scholarship and student-aid funds provided by the university and by the Government.

8. *New library building and the future outlook.*—The new library building in immediate prospect holds hope of release from the crowded space in the present building. This greatly needed advanced step emphasizes, however, the painful inadequacy of our collection of books and periodicals in every division of the university. This has been long recognized and the General Education Board, the Laura Spellman Foundation, and the Carnegie Corporation have endeavored to help the university by gifts for the development of the libraries of the natural sciences, medicine, law, and dentistry. These grants have all now expired. Increased funds for books are greatly needed.

PERSONNEL

1. *The registrar.*—The registrar and his seven assistants continue to conduct the correspondence concerning admissions for all divisions of the university, to keep the student records in all divisions in a manner acceptable to the decisive accrediting agency thereof, to issue official transcripts of records, to develop an accurate classified list of the records of the university, to serve as secretary of five faculties of the university and to perform other valuable committee services. During the year he made a special study of the records of 1,082 freshmen undergraduate students for a 5-year period, correlating the same with the results of the psychological tests, and prepared a graphic chart showing the geographical distribution of the living graduates of the university whose addresses were available.

2. *Student health.*—By reason of the restricted budget of the university the division of student health was obliged to suffer the loss of both of its half-time assistant physicians. The staff this year consisted of 1 full-time physician, 2 nurses, 1 secretary, and 5 part-time student assistants, working in 6 rooms on the second floor of the gymnasium building, 4-room units on the top floor of the men's and women's dormitories and in cooperation with the X-ray unit of the university and the facilities of Freedmen's Hospital. The staff engaged in the following major forms of service: (1) Detailed physical

examination of all entering students, recording all defects and outlining correction; (2) consultation service for all illnesses in which 2,900 voluntary calls were made, including 800 calls of the nurse in the women's dormitories, the service being improved this year by the addition of a psychiatric consultant and by a revised system of records; (3) early diagnosis of tuberculosis; (4) the care of students confined to bed with illness, including 26 men and 31 women in the dormitory infirmaries for an average period of 4 days each, in addition to 25 student cases cared for in the Freedmen's Hospital and 6 operative cases; (5) the routine conduct of community hygiene; (6) the promotion of health education through several media, including poster service, special health exhibit on cancer control and prevention, etc.; (7) care of athletes; and (8) special inoculation of student candidates for military camps against contagion. The director served as member of the organization committee of the American Student Health Association during the year and the institutional health committee for the conference on fundamental problems in Negro education.

3. *The deans of women and men.*—The dean of women and the dean of men exercise supervision over the dormitories and the general living conditions of the students; with the advice and cooperation of a faculty committee on student activities they also supervise the extra-curricular activities of students; and by personal interviews and otherwise they try to acquaint themselves with and to correct any one of many personal factors which may be obstructing the individual student from able intellectual performance and progress. The dean of men reports that the men students quickly took advantage of the reduced dormitory fees and occupied all space in Clark Hall—the sole men's dormitory—as well as all unused room space in Miner Hall, a temporary administration building. The dormitory enrollment of women was not substantially increased, however.

By reason of the limited budget of the university and the continuing small residence group of women all boarding facilities for men and women were concentrated in the women's dormitories.

The dean of men's studies show that men students living in the dormitories in general maintain a higher average of scholarship and show fewer failures. This is indicative of the fact that even our present poorly equipped men's dormitory affords a helpful stimulus to study. It is hoped that better dormitories may soon be available. Clark Hall is old and expensive to repair and its room furnishings are miserable. The trustees have tried little by little to improve it but it is obvious that it must be replaced at the earliest possible time by a new dormitory affording modern conveniences.

BUILDINGS AND GROUNDS

Through the use of specially appropriated Public Works funds in the amount of \$98,811 (actual use \$77,801.85) and the assignment of men and materials to the university by the Civil Works Administration, the buildings and grounds of the university were extensively repaired and reconditioned. A further sum of \$89,064.48 was spent from private funds of the university, provided by the general education board and the Julius Rosenwald Fund, and from the income of properties previously purchased through extension funds, for the purchase of additional lands and for the improvement of these properties. The total increases in the land resources for the further expansion of the university, provided from these private gift funds, has now reached the value of \$1,089,399.25. The trustees have taken immediate advantage of their ownership of these properties to destroy an entire block of tenement houses which were fitted with sanitary facilities of miserably poor quality and otherwise in such a low state of repair as to be unfit for habitation.

TABLE 13.—*Building projects in process, 1933-34*

Number	Description of project	Date authorized	Total appropriations
2-----	Construction and equipment of a chemistry building-----	May 4, 1929	\$475,500
5-----	Construction and equipment of a library building-----	Feb. 14, 1931	800,000
7-----	Construction of educational classroom building-----	-----do-----	460,000
8-----	Construction and equipment of heat, light, and power plant.	Feb. 17, 1933	460,000

The status of the above-listed projects is as follows: Project no. 2—contract for chemistry building let and building under construction; contract for equipment delayed pending Government action on university's request for \$150,800 additional to complete the contract under the 68 percent increased costs prevailing on April 9, 1934, when bids were returned. Project no. 7—classroom contract let and building construction well under way. Project no. 8—heat, light, and power plant plans and specifications completed and bids returned; equipment contract held up pending Government decision on the availability of additional money to meet the increased costs under the codes. Project no. 5—library final plans and specifications are almost ready and are expected to be completed in August.

The total amount appropriated by the Congress for buildings at the university, impounded by the Executive and at length restored by the Public Works Administration, was \$2,100,000. Since these appropriations—specifically on April 9, 1934—bids have shown building construction costs to have risen by 17 percent and scientific equipment costs to have risen by 68 percent. Thus far the Public

Works Administration has awarded to Howard University an additional sum of \$85,500 or approximately 4 percent, in addition to the sums appropriated by Congress, to make possible the construction of these buildings.

FINANCES

The year 1933-34 was the first full year of operation with the reorganized system of finances voted and installed by the trustees. All finances and business administration of the university were concentrated in the treasurer's office, as redefined by trustee statute. All trustee committees formerly engaged in financial supervision of any sort were combined in the finance committee, and the accounting system of the university was operated on a revised basis conforming with a system agreed upon by the American Association of Universities and the American Association of Colleges. The new system worked with great advantage, facilitating current control, economy of expenditure, and a balanced budget.

I submit herewith the treasurer's financial statement (omitted from this summary), audited by certified public accountants, showing the balance sheets of the university with assets, liabilities, and funds as of June 30, 1933. A statement of income and expenditures, from current and capital funds, is included, with a further statement showing the distribution of expenditures from Government appropriations, as at June 30, 1934.

The total assets of the university at June 30, 1934, were \$6,450,335.-22, exclusive of the unexpended balances of Government appropriations for the chemistry building, the classroom building, the heat, light, and power plant, and the library. Of the total assets \$1,089,-398.25 represented assets in physical plant extension made possible through private gifts; \$861,153.67 represented endowments; \$4,280,-300.28 represented plant fund assets, exclusive of the unexpended balances of Government appropriations for buildings, as indicated above. The remaining \$219,483.02 represented assets of the current fund.

The total income for the year was \$1,269,495.94, including current and capital funds. This represents a gross increase of \$210,271.08 over the total income for 1932-33. The total income for current expenditures was \$950,472.49 representing a slight gross increase over the sum of \$937,144.26 for 1932-33. The sum \$950,472.49 includes however, a special appropriation from the Federal Government of \$77,801.85 for reconditioning and repair of buildings. The actual income for current educational expenses from the Federal Government was \$605,874.77 or \$26,000 less than the income from the Federal Government for current expenses during 1932-33. There was a decrease also in private income for current expense from \$377,606.91 in 1932-33 to \$343,618.48 in 1933-34.

The total expenditures for all purposes, current and capital, were \$1,200,047.43 as compared with \$1,035,269.98 for the previous year, or an increase of \$164,177.45. The total expenditures for current purposes, however, were \$957,847.59 as compared with \$985,482.95 during the previous year, or a reduction of \$27,635.36. Attention is respectfully directed to the increase in the amount and percentage expended for administration and to the decrease in the amount and percentage spent for regular operation and maintenance, as well as to slight increase in the amount and percentage spent for the general library. These are trends which the university hopes to maintain.

Once again economical administration has made possible an excess of income over expenditures in the amount of \$69,448.51 and a consequent reduction of the current fund deficit from \$135,149.70 to \$66,189.79.

It will be observed also that the income received from the Federal Government and from private sources was kept at balance, varying only seventy-eight one-hundredths of 1 percent from the percentages planned in the 10-year program.

The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress were expended under the supervision of the Department of the Interior.

FREEDMEN'S HOSPITAL

W. A. WARFIELD, Chief Surgeon

During the period covered by this report the wards of the hospital, like the preceding year, were filled to capacity, and the number of applicants refused admission on account of a lack of beds was greatly in excess of last year.

On the administrative side the work exceeded any previous year. All of the projects made possible by the allotment of \$85,000 of the Public Works Administration funds have been completed except one, repairs to the elevator in wing I. This project called for the installation of a new elevator but the funds were sufficient for repairs only, which will make it safe for use for some years to come.

PATIENTS

There were 251 patients remaining in the hospital at the close of the fiscal year 1933, of whom 31 were pay patients, 73 indigent residents of the States, and 147 indigent residents of the District of Columbia. During the year 5,020, including births, were admitted, making a total of 5,271 indoor patients under care, as against 5,139 the preceding fiscal year.

Of the number admitted, including births, 637 were pay patients, 1,387 were indigent residents of the States, and 2,996 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 5,035, of whom 2,649 had recovered 1,908 improved, 144 unimproved, and 334 died, leaving 236 in the hospital July 1, 1934, of which number 36 were pay patients, 59 indigent residents of the States, and 141 indigent residents of the District of Columbia.

The mortality rate for the year was 6.3 percent, notwithstanding 108 died within 48 hours after admission. Autopsies were performed on 30.6 percent of all deaths.

There were 2,208 surgical operations; 1,107 major and 1,101 minor.

In the dental department 3,367 were treated as against 1,951 last year.

Nineteen thousand three hundred and ninety-three were treated in the out-patient department, of whom 7,785 were new patients. Seven thousand three hundred and nine were treated in the emergency

department. This department, like the indoor, was overcrowded. Many applicants could not receive attention because of the small force of employees. It is urgent that additional clerical and social service help be provided for this department.

The following table shows the number of visits to the various clinics:

Clinic	Number of visits	Clinic	Number of visits
Dermatology.....	1, 292	Oral surgery.....	378
Ear.....	215	Orthopedic.....	5, 509
Nose.....	212	Pediatric.....	2, 676
Throat.....	2, 093	Prenatal.....	1, 442
Eye.....	2, 086	Postnatal.....	251
Urological.....	5, 530	Surgical dressing.....	7, 485
Gynecological.....	3, 726	Minor surgical.....	1, 342
Luetic.....	3, 237	Tubercular.....	282
Medical.....	5, 290		
Neurological.....	789	Total.....	43, 865

The total number of patients receiving the benefits of the hospital was 24,664, or 3,015 more than last year.

In conformity with the action of the American Association of Hospital Social Workers, in convention at Kansas City, the social service department will be designated hereafter as the Department of Medical Social Service. As in previous years the coordination of the work in this department with the school of nursing consisted in a course of 16 lectures by the director of social service to the senior nurses. Consideration is now being given by the superintendent of nurses to the assignment of student nurses to this department for observation during their preliminary period.

THE SCHOOL OF NURSING

The graduate personnel in the nursing department must be enlarged, not only to reduce the hours of service to 8, day and night, but because adequate care of the patients makes it imperative.

The duties of a nurse are very taxing and strenuous, and it should not be expected that she can do her best working from 10 to 12 hours a day, which does not allow proper time for recreation and study. The registration of the school by the State nursing board is in danger of cancelation if the hours of duty are not reduced to a daily basis of 8. This is being required of all schools.

To meet this acute situation, 21 graduates are needed and must be provided without delay.

NEEDS

As stated in the last annual report, the outstanding and most urgent need of the hospital is a larger personnel. In the main the care of the sick may be divided into three major groups: First, physical equipment

such as housing, apparatus, and machinery; second, sustenance, such as food, heat, and medication; and third, service, which embodies personnel. Hospitals are classified according to their preparation to meet the requirements along these three lines and the sick can be cared for only in proportion as the institution is equipped to meet their needs. Loss of rating means inadequate care of the ill, and likewise means inability of those who serve them to receive accredited recognition for their service.

The first two elements by which we are judged, physical equipment and sustenance, have been adequately met, but the increase in personnel has in no degree kept pace with the steady growth of the hospital, and as a consequence our standing has been jeopardized. Our most glaring deficiency is in the nursing department, where 21 additional graduates must be employed in order that the patients may receive the minimum of required care, and that the hours of duty for the nurses, according to standard requirements, may be reduced to a daily basis of 8 hours. Twenty-six thousand four hundred and sixty dollars are required for this need.

Other employees of whom we are in great need in order to satisfy the demands of minimum standards are: 4 residents, 1 clerk, 1 matron, 4 orderlies, and 1 maid. Eight thousand seven hundred dollars will be needed to provide these employees.

The correction of these deficiencies is imperative. The request for these additional employees is not a matter of desire but a matter of demand upon the part of those who set the standards and requirements of the personnel needed to properly care for the hospital sick. The hospital can only attain its true aim and be perpetuated by meeting these requirements.

Statistical summary

	1934					1933				
	Colored		White		Total	Colored		White		Total
	Male	Female	Male	Female		Male	Female	Male	Female	
In hospital July 1, 1932.....						16	18			34
In hospital July 1, 1933:										
Pay patients.....	13	18			31					
Indigents:										
United States.....	26	46	1		73	38	41			79
District of Columbia.....	62	85			147	64	53			117
Total.....	101	149	1		251	118	112			230

Statistical summary—Continued

	1934					1933				
	Colored		White		Total	Colored		White		Total
	Male	Female	Male	Female		Male	Female	Male	Female	
Admitted:										
Pay patients.....	219	352			571	253	418	1		672
Pay-patient births.....	29	37			66	32	34			66
Indigents:										
United States.....	402	807	8	3	1,220	407	761	3		1,171
District of Columbia.....	891	1,526	12	2	2,431	878	1,429	10	2	2,319
Births:										
United States.....	69	96		2	167	74	81			155
District of Columbia.....	266	299			565	252	273		1	526
Total admitted.....	1,876	3,117	20	7	5,020	1,896	2,996	14	3	4,909
Total indoor under care.....	1,977	3,266	21	7	5,271	2,014	3,108	14	3	5,139
Stillbirths:										
Pay patients.....	1	3			4	1	2			3
Indigents.....	25	20			45	30	27			57
Total.....	26	23			49	31	29			60
Discharged, including births:										
Pay patients:										
Recovered.....					412					397
Improved.....					207					283
Unimproved.....					13					9
Total.....					632					689
Indigents:										
Recovered.....					2,237					1,991
Improved.....					1,701					1,733
Unimproved.....					131					159
Total.....					4,069					3,883
Deaths:										
Pay patients.....	27	23			50	27	24	1		52
Indigents.....	153	127	3	1	284	137	127			264
Total.....	180	150	3	1	334	164	151	1		316
Grand total discharges.....					5,035					4,888
In hospital July 1, 1934:										
Pay patients.....	14	22			36	13	18			31
Indigents:										
United States.....	23	36			59	26	46	1		73
District of Columbia.....	60	81			141	62	85			147
Total.....	83	117			200	88	131	1		220
Grand total remaining.....	97	139			236	101	149	1		251
Day's maintenance:										
Pay patients.....					11,416					11,237
Indigents:										
United States.....					26,083					24,498
District of Columbia.....					50,932					49,301
Total.....					88,431					85,036

	1934	1933
Cost per patient per day.....	\$2.85	\$3.10
Largest number of indigents at any one time.....	252	249
Smallest number of indigents at any one time.....	182	168
Daily number of patients, pay and indigent.....	242	232
Average number of days hospitalization per patient.....	17	16.48
Daily average number of patients, outdoor.....	180	138
Number of indigents admitted from District of Columbia, including births.....	2,996	2,845
Number of prescriptions compounded:		
Indoor.....	32,807	34,297
Outdoor.....	23,544	22,397

Financial statement—Receipts and disbursements on account of pay patients

	1934	1933
RECEIPTS		
Private-room patients, at \$2 per day.....	\$6,492.00	\$6,358.00
Ward patients, at \$2 per day (Veterans' Administration).....		7,128.00
Ward patients, at \$1.75 per day.....	5,964.00	7,183.25
Children, at \$1 per day.....	239.00	168.00
Babies, at 50 cents per day.....	163.00	209.00
Use of operating rooms.....	1,231.00	1,423.00
X-ray photos.....	395.00	685.00
X-ray photos (Veterans' Administration patients).....		520.00
Other charges.....	48.00	175.00
Other charges (Veterans' Administration patients).....		278.00
Total	14,532.00	24,127.25
DISBURSEMENTS		
Subsistence.....	1,313.90	
Medical and surgical supplies.....	2,686.47	4,051.35
Miscellaneous (dry goods, repairs, fuel, etc.).....	10,239.94	18,001.35
Refund of overpayment by patients.....	225.25	209.25
Total	14,465.56	22,261.95
Unexpended balance	66.44	1,865.30

*Receipts and disbursements, 1934***RECEIPTS****Appropriation, Interior Act:**

Salaries.....	\$199,270.00
For support.....	76,860.00

276,130.00

From pay patients.....	14,532.00
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From Howard University.....	46,108.63
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Total	336,770.63
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DISBURSEMENTS

Miscellaneous, appropriation (fuel, light, clothing, medicine, etc.)..	36,666.59
Miscellaneous, pay patient (fuel, light, clothing, medicine, etc.)...	12,926.41
Miscellaneous, Howard University (fuel, light, clothing, medicine, etc.).....	45,541.44

Subsistence appropriation.....	39,579.50
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Salaries.....	177,260.88
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Pay-patient subsistence.....	1,313.90
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Refunds, pay patients.....	225.25
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Total	313,513.97
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UNEXPENDED BALANCE

Miscellaneous appropriation.....	193.41
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Subsistence.....	420.50
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Salaries (including salary reductions of \$17,347.59).....	22,009.12
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Pay patient.....	66.44
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Howard University.....	567.19
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Unexpended balance, total	23,256.66
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THE COLUMBIA INSTITUTION FOR THE DEAF

PERCIVAL HALL, President

During the fiscal year ended June 30, 1934, there were under instruction in Gallaudet College, the advanced department, 142 students, 88 men and 54 women, representing 34 States and Canada. In the Kendall School, the primary and grammar department, there were 70 pupils, 41 boys and 29 girls. There was a net decrease of 2 students during the year, as 44 were admitted and 46 discharged. Sixty-four pupils were from the District of Columbia.

The health of the students was uniformly good, partly no doubt due to preventive inoculations against typhoid, smallpox, scarlet fever, and diphtheria and partly due to special pains taken to provide exercise and good diet, including carefully produced milk from our own dairy.

Regular courses of study in Gallaudet College and Kendall School were continued, with a revival of instruction in bacteriology in the college department for a few selected students.

Studies have been made during the year by competent engineers of the power, light, and heating needs of the institution, of additional buildings needed, and the size and location of these. These studies show that even with the present plant the heating and lighting loads on our power plant are excessive. Crowded conditions call for the construction of a library and recitation building, for which the alumni have already contributed \$50,000. Additional funds for a thorough revision and enlargement of the power plant heating and lighting systems and for the additional building mentioned should be provided at an early date.

The salary scale of the employees should be improved, and a research department with at least two workers added. There is a large and valuable field for this type of work, which could be economically and conveniently done in our institution. There is no other place in the world where students are assembled whose age range and educational range, as well as geographical selection, are as wide as those of our pupilage.

The total receipts for the year were \$165,701.79; total expenditures, \$159,351.42. There was impounded in the Treasury \$4,555.54, and

a balance of \$1.92 returned unexpended. Expenses from invested funds amounted to \$1,446.70.

On presentation day degrees of master of arts in course were conferred on 6 members of the normal department, degrees of bachelor of arts on 10 deaf students of the college, and degrees of bachelor of science on 13. Honorary degrees of master of arts and doctor of humane letters were conferred on Superintendent Thomas Rodwell, Winnipeg, Manitoba, Canada, and Superintendent J. W. Blattner, Sulphur, Okla., respectively.

LIST OF STUDENTS FOR 1934

THE NORMAL DEPARTMENT

California.—Margaret E. Bruns.

Colorado.—Mabel Northern.

Kentucky.—Robert Baughman.

Minnesota.—Stanley D. Roth.

Missouri.—Daniel Pratt Tucker.

South Dakota.—Edward W. Tillinghast.

GALLAUDET COLLEGE

Alabama.—Jones.

Arkansas.—Brown (Norman), Collums, Drake, Goodin, Hirschy, Rountree.

California.—Aho, Brother, Jacobs, Ladner, Layne, Miller (Robert), Naftaly, Norton, O'Branovich, Ott, Vaughn, Watso, Wight.

Colorado.—Culbertson.

Connecticut.—Koziar.

Florida.—Long (Dan), McNeilly, Wilson (Warren).

Illinois.—Burditt, Davis (John), Estes, Holmgren, Hyman, Leicht, Reidelberger, Yeager, Adams.

Indiana.—Fehrman, Whisman.

Iowa.—Crawford, Weisbrod, Parks.

Kansas.—Benoit.

Kentucky.—Logan.

Massachusetts.—Antila.

Michigan.—Paananen, Blackinton.

Minnesota.—Corneliussen, Hillman, Montgomery, Sellner.

Missouri.—Goetter, Lusk, Worsham.

Mississippi.—Davis (Cecil).

Nebraska.—Kelly, Slocum.

New Jersey.—Davidowitz, Higgins, Silverman.

New York.—Caligiuri, Greenmun, Kowalewski, Marshall, Patrie, Slanski, Susco.

North Carolina.—Farnell, Hinnant, Kinlaw, McCord, Parker.

North Dakota.—Berg, Clarke, Marsh, Ottaway, Poyzer, Tollefson, Walford.

Ohio.—Brown (George), Ellerhorst, Franklin, Gefsky, Marino, Miller (Lynn).

Oklahoma.—Tucker.

Oregon.—Grote, Kreplea, Stacks.

Pennsylvania.—Adler, Havens, Hanover, Hoffmeister, Long (Calvin), Mussman, Nichols, Pristera, Sollenberger, Swope, Ulmer.

South Carolina.—Parrott, Wilson (Louise).

South Dakota.—John, Servold, Sorensen.

Tennessee.—Akin, Boyd, Lucado.

Texas.—Crockett, Davis (Hazel), Gamblin, Hays, Higgs, Zimmerman.

Utah.—Burnett, Curtis.

Virginia.—Golloday.

Washington.—Delp, Mantz, Jozefoski, Nelson, Olsen, Rath, Stanfill, Travis, Vogt.

Wisconsin.—Grabill, Horgen, Kuglitsch, Maertz, Oryall, Ragsdale, Thompson.

Wyoming.—Atkinson, Burdett.

Canada.—Buchan, Paterson.

KENDALL SCHOOL

Illinois.—Frederick Olsen.

Virginia.—Francis Poe.

District of Columbia.—John Adams, Helen Alsop, Byron Baer, Frank Barber, Helen Beavers, Henry Beckert, Edwin Blaisdell, Orval Berrios, Jose Berrios, Marion Bowling, Joseph Cappola, Theodore Chaconas, Ralph Cherrico, Sylvia Cohen, Ruth Colbert, Gilbert Corman, Milton Corman, Hugh Curtiss, Bernard Davidson, Laura Dizon, Milton Dye, Richard Eckert, Maurice Graham, Margaret Hatch, Thelma Henry, Lucille Hillengas, Ralph Hisey, Dixon Hospital, Stanley Jarboe, Valentine Johnson, Robert Johnston, Ida Juenamann, Harold Lomonosoff, Sarah Louck, Lola Lumpkin, Christine Magee, Orville McPherson, Thomas Mead, John Moore, June Moore, Patrick Murphy, Barbara Myer, Vincent Rabbitt, William Ramsey, Myrtle Redman, Patrick Reese, Betty Rice, Mary Riley, Anna Schlegel, Meda Scott, Edna Smoak, Homer Smoak, John Steuchler, Keeny Stewart, Mae Stewart, Georgia Satriakos, Wallace Travland, Mary Tsoulas, Louis Val, George Watson, Betty Wood, Estella Wood, Thomas Zimmerman, Woodrow Zimmerman, Helen Brodtkin, J. Edwin Hunter, Robert Miller.

THE ALASKA RAILROAD

(O. F. OHLSON, general manager)

GENERAL REMARKS

The program of improvements and rehabilitation consisting of ditching, bank widening, grade raising and filling in of wooden trestles, and replacing wooden culverts with concrete pipe of the railroad progressed favorably, although it was necessary to utilize maintenance forces during the earlier part of the fiscal year to complete repairs caused by heavy rains and cloudburst that occurred during August 1932; ballasting and bank widening of main track between mile 414 and 443 were, however, commenced as soon as weather conditions permitted at the latter part of fiscal year, which work will be completed by September 15, this year.

Twenty steel drop-bottom coal cars were purchased from the Koppel Manufacturing Co., Koppel, Pa.

Ten convertible ballast and coal cars were purchased from Pacific Car & Foundry Co., Seattle, Wash.

Ten 25-yard air dump cars were purchased from Western Wheeled Scraper Co., Aurora, Ill.

INVESTIGATION AND DEVELOPMENT OF MINERAL RESOURCES

The Alaska Railroad in cooperation with the Alaskan branch of the Geological Survey continued its investigations of the mineral resources in the territory tributary to the railroad and aided projects that would contribute tonnage as well as those that affected the general welfare of the Territory.

One major field project, the examination of the southwestern portion of the Talkeetna Mountains and adjacent to the Willow Creek gold district, was undertaken during the fiscal year 1934. The investigation showed a northeastern continuation of the gold mineralization of the Willow Creek district, but with a tendency for the ore to become lower grade and baser in character. A part of the area is favorable for future prospecting. In addition to the one major field project, numerous examinations of placer and lode prospects extending from Seward to Fairbanks were made. These examinations consisted of the identification of minerals, sampling of veins, and detailed mapping and geologic work to aid further prospecting and development.

An examination of the railroad's coal lease unit no. 7 and plans for its future development as an emergency reserve were made.

Exact figures for the mineral production of the area served by the Alaska Railroad are not available, but it is estimated that during the fiscal year 1934 the total value of the mineral production was over \$6,000,000. New developments in the mining industry are given below:

Base ore developments are still at a standstill due to the prevailingly low prices and gold continues to be practically the only metal mined in the railroad belt. Stimulated by the increased gold price, the producing mines increased their capacities, the development of many new properties was started, and the prospecting of new and old areas was prosecuted with increased vigor. Unfortunately, unsettled labor conditions on the waterfronts of Seattle, Portland, and San Francisco handicapped the movement of supplies and equipment necessary for these projects during the latter part of the fiscal year, but the outlook is encouraging for the future.

In the Fairbanks district, prospecting has increased the known area of minable gold-bearing gravels, so that the addition of two new dredges is contemplated. This development will also result in a material increase in the coal production of the railroad belt due to increased power needs. The mechanization of numerous placer gold properties in the Yukon Valley is proceeding vigorously. A number of gold lode properties are meeting with success in their operations and development work in the Fairbanks, Valdez Creek, Willow Creek, Girdwood, and Moose Pass districts. Development work was also started on the Kantishna lead-silver-gold, and the Broad Pass arsenopyrite-gold deposits, which if successful will contribute materially to the tonnage handled by the Alaska Railroad.

AGRICULTURAL DEVELOPMENT

The program of settlement of agricultural lands adjacent to the Alaska Railroad was continued during the year on a lesser scale, because the initial investment and capital necessary as a prerequisite to homesteading in Alaska prevented many from making this venture, and for this reason a personal contact agent was not employed to interest prospective settlers.

During the year, 4 families settled in the Matanuska Valley, and 2 in the Moose Pass district, taking up homesteads comprising a total of 624 acres.

TOURIST TRAFFIC

Tourist traffic remained approximately the same as previous year with an indication of an increase, notwithstanding number of cancellations due to the Pacific Coast longshoremen's strike, and it is the opinion that travel to Alaska will increase each year.

FINANCIAL

Revenue from all sources including nonoperating income was \$1,293,684.30, an increase of \$77,856.17, or 6.403 percent.

The operating ratio of the railroad decreased from 122.73 in 1933 to 117.26 in 1934.

Total expenses for rail and river boats were \$1,471,496.06, a decrease of \$21,588.16, or 1.46 percent.

Total deficit for rail and river boat operation and miscellaneous operations was \$178,973.33, a decrease of \$78,110.40, or 30.38 percent, less \$7,371.53 expended fiscal year from \$250,000 provided in Appropriation Act of 1932 for continuation of the investigation of mineral and other resources. Therefore, the annual deficit amounted to \$171,601.80.

There was a decrease of 3,967 tons in rail line tonnage during 1934 from the previous year, with an increase of \$74,669.78 in revenue over the previous year.

The decrease in tonnage was due to reduction in commercial coal shipments, which decreased 6,998 tons under previous year and carries a low rate. The increase in revenue was due to the increased shipments of l.c.l. merchandise, lumber, gasoline, oils, and outbound fish, which commodities carry a much higher rate.

The pay roll for 1934 amounted to \$1,242,700.40, an increase of \$77,236.33 over the previous year.

GENERAL BUSINESS CONDITIONS AND OUTLOOK FOR TRAFFIC IN FUTURE

Placer and dredging operations in the Fairbanks district and other sections adjacent to the railroad indicate increased and continued activities. A water shortage in 1933 seriously affected the output of the placer workers. The outlook for the year 1934 is very favorable, considering the price received for gold and indications of sufficient water for operations.

Quartz mining activities in the Willow Creek district is on the increase with several good producing properties now in operation.

At the present time there are no apparent indications of increases in general business in any other lines for the coming fiscal year.

THE PERRY'S VICTORY MEMORIAL COMMISSION

(WEBSTER P. HUNTINGTON, President)

The Fourteenth Annual Report of the Perry's Victory Memorial Commission to the Secretary of the Interior for the fiscal year ended December 1, 1933, described the condition of the memorial and its site as satisfactory in regard to preservation and use by the public, but pointed out the necessity of certain improvements to the property and other disbursements deemed indispensable in consequence of the reduced revenues of the memorial during the two preceding seasons.

The improvements and disbursements were specified in a request for an appropriation by Congress in the sum of \$25,025 for specific objects, to wit: For the construction of a concrete retaining and sea wall along the north front of the memorial grounds and present highway, \$18,400; for repairs to the concrete retaining wall and walkway along the south front of the memorial grounds, \$1,200; for expenses incurred by the Commission in connection with the contract to change the drainage system of the memorial, \$2,000; for expenses incurred in connection with the contract to install the electric-lighting system of the memorial as authorized by Congress and duly carried out, \$2,465; for a new electric elevator cable, \$570; for the installation of a ground switch in connection with the electrical transformers on the memorial grounds, to guard against leakage of electric current, \$215; for repairs to the lightning-protection system of the memorial and premium on 5-year bond against damage from lightning, \$175; in all, \$25,025.

In April 1934 the request of the Commission for such appropriation by Congress was withdrawn upon a grant of \$25,025 in a lump sum by the Federal Administration of Public Works for the purposes named, which, June 20, 1934, were authorized to include \$450 for administrative expenses. Under this grant the Commission, on June 23, 1934, let contracts under competitive bidding to Alfred Schnurr, general contractor, of Sandusky, Ohio, for construction of the proposed north retaining wall in the sum of \$17,100 and for repairs to the south wall in the sum of \$1,100. At the time of filing this report execution of the first-named contract is nearing completion and the second is in progress. Contracts have also been let to and performed

by the Otis Elevator Co., of Cleveland, Ohio, for installation of new elevator cables in the sum of \$666.89 and the Ohio Public Service Co. for the proposed ground switch in the sum of \$215. Other disbursements and work under the allotment are in progress of negotiation to cover within a reasonable time the remaining objects contemplated.

The season of 1933 at the memorial May 30 to September 14, resulted in total receipts from operation of \$2,527.45 and total expenditures of \$2,526.62. Total indebtedness from operation during that season and the preceding two seasons was at the time of filing the report approximately \$2,000, and there was a so-called "standing indebtedness" due on contracts for changing the drainage system and installing the electric light plant and constructing a souvenir stand of \$5,005, which will be reduced to \$540, for the souvenir stand only, by application of the Public Works Administration grant to payment of the other amounts due.

While complete figures for operation during the season of 1934 are not available at the time of filing this report, the revenues to date indicate for the season an increase of approximately 20 percent as compared with the previous season and a reduction of 20 percent in operating cost. Of the total receipts the Commission will be able to pay a substantial amount for reduction of indebtedness due to operation during the two preceding seasons.

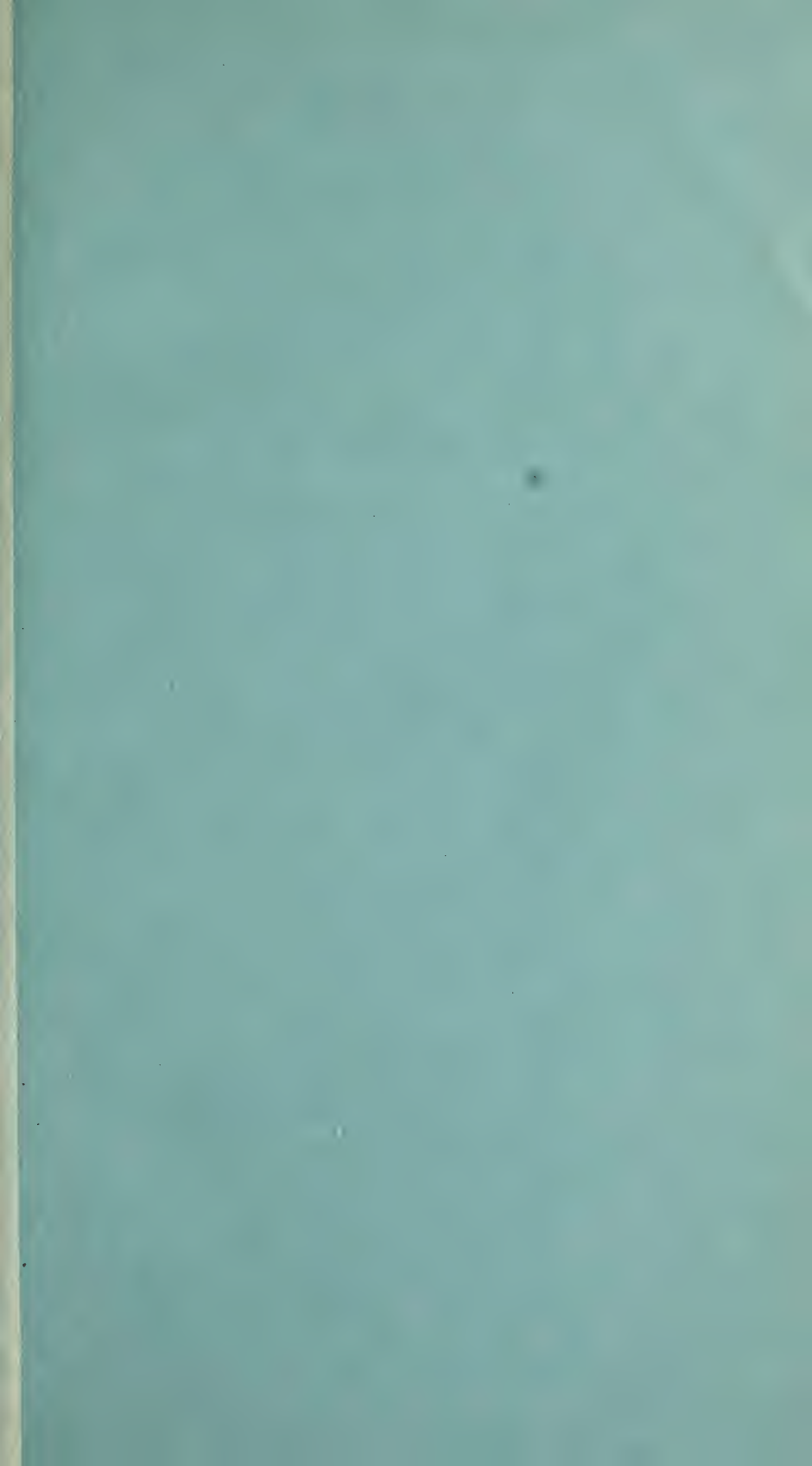
THE ADVISER ON ECONOMIC STATUS OF NEGROES

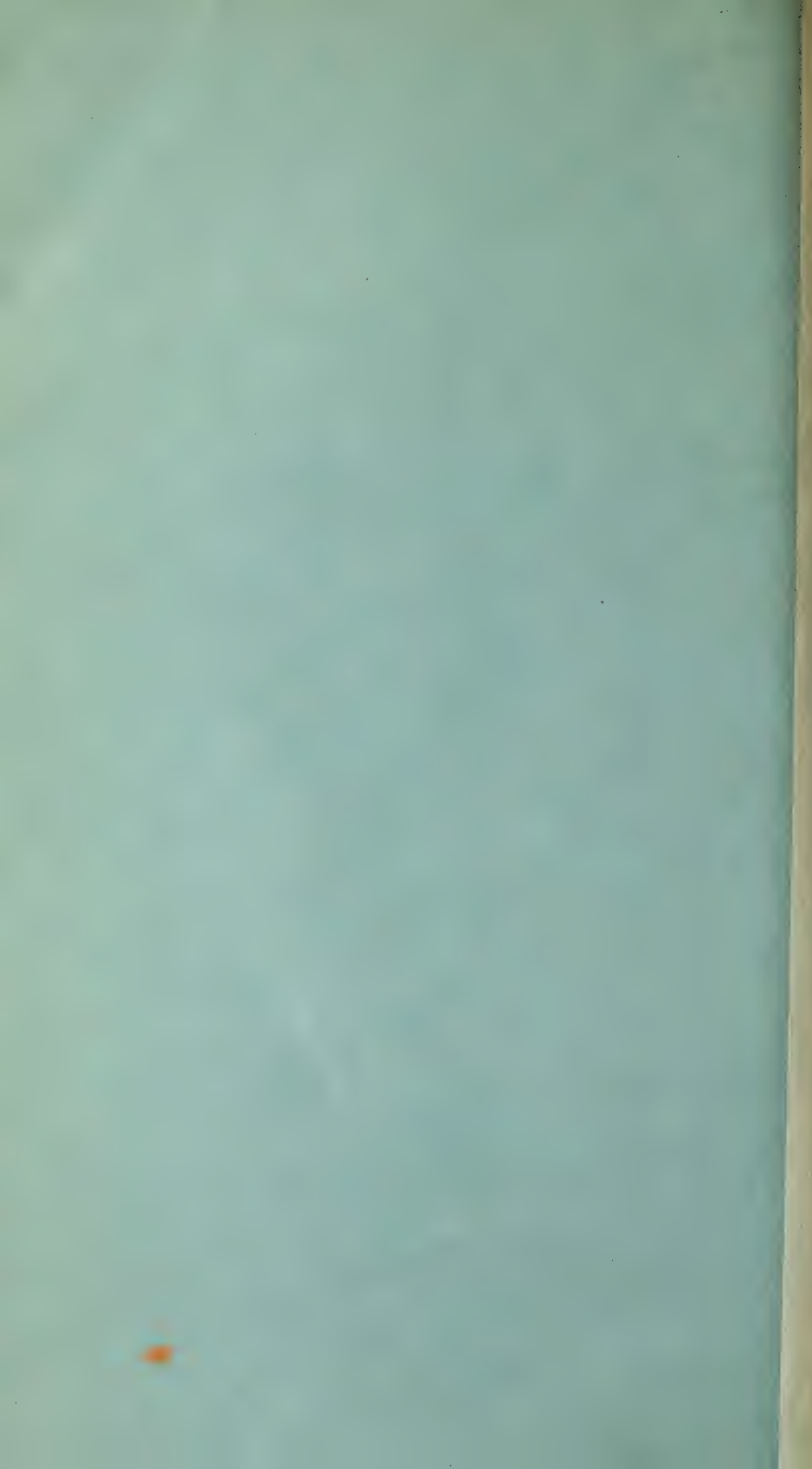
CLARK FOREMAN

The Adviser on the Economic Status of Negroes has advised the Secretary of the extent to which Negroes are participating in the recovery program and work of the Department. The Adviser has made investigations and has been consulted by numerous persons other than the Secretary, to the end of securing the maximum benefits to the Negro population and the placement of qualified Negroes in the various services of the Department.

In accordance with the orders of the Secretary, the Adviser has sought to integrate Negroes into the work of the Department and also to bring to his attention instances of discrimination. The Adviser has also been called on by other parts of the Government for help and counsel. At the suggestion of the Secretary he called together an interdepartmental group to discuss special problems of Negroes which exceed the scope of any one department.

Numerous protests and requests for information have been handled by the Adviser and an attempt made to correct misunderstandings and to adjust any abuses that may have occurred.





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ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR

FOR THE FISCAL YEAR ENDED JUNE 30
1935

ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR



FOR THE FISCAL YEAR ENDED JUNE 30

1935



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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington, November 30, 1935.

SIR: I have the honor to transmit my annual report for the Department of the Interior for the fiscal year ended June 30, 1935.

Very respectfully,

HAROLD L. ICKES,
Secretary.

THE PRESIDENT,
The White House.

THE REPORT OF THE SECRETARY OF THE INTERIOR TO THE PRESIDENT FOR THE FISCAL YEAR ENDED JUNE 30, 1935

As in my two preceding reports, I shall not attempt here to interpret or give a résumé of the detailed reports of the various divisions, offices, and bureaus of the Department of the Interior which follow.

Since my last annual report there have been two important changes in the organization of this Department. The Soil Erosion Service, originally set up by this Department, was transferred by Executive order to the Department of Agriculture. Also, the Division of Subsistence Homesteads, likewise set up in this Department, was transferred by Executive order to the Rural Resettlement Administration.

Although the petroleum code no longer exists, certain legislation was enacted by Congress, designed to control petroleum production. The Petroleum Administrative Board has continued to function and, therefore, its annual report is included herein.

As heretofore, in the interests of economy, every effort has been made to cut down the volume in this report without sacrificing any initial information. Fuller particulars of the activities of any part of the Department are available in its files.

THE SOLICITOR

(NATHAN R. MARGOLD)

At the close of the fiscal year, as well as at its beginning, the legal staff of the Department consisted of 67 attorneys serving in Washington and in the field under the jurisdiction of the Solicitor. During the year three attorneys were added to the immediate staff in the central office of the Solicitor. However, the aggregate membership of the legal sections attached to various bureaus in the Department was decreased by the same number. Thus, the personnel remained nearly constant during the year. Yet, the business of the Solicitor increased greatly over the same period.

In the year 1933-34, 84 formal opinions were rendered by the Solicitor. During the year ended June 30, 1935, the number of opinions rendered was 237, an increase of almost 300 percent. About one-third of these opinions concerned accident claims, which have been very numerous in connection with emergency conservation work and other operations in areas under the jurisdiction of the National Park Service. Some 50 title opinions have been required, the majority of them in connection with the land-purchase program of the National Park Service. Less numerous, but individually more important, have been those opinions rendered in response to particular legal inquiries concerning the interpretation and administration of the Indian Reorganization Act, the Taylor grazing law and the general withdrawal of the public domain under the Executive orders of November 26, 1934, and February 5, 1935. Other matters involved in important opinions have been so miscellaneous as these:

Applicability of State sales and license taxes to operations of concessionaires within national parks;

Duration of power of the President to reorganize the Executive branch of the Government and application of that power to the government of the District of Columbia;

Right of certain Wisconsin Indians to enrollment with the Chippewas of Minnesota;

Resettlement of rural groups under subsistence homestead legislation;

Establishment of national monuments under the act for preservation of American antiquities;

Right of St. Elizabeths Hospital to hold soldiers and sailors in custody after their discharge from the service; and

Wages and hours of Park Service employees engaged in trades.

Appeals and related motions in public-land cases have increased about 100 percent. Land cases received this year numbered 1,018, contrasted with 520 similar cases received during the preceding year. However, this increase has not been allowed to cause an accumulation of pending cases. A year ago 407 cases were pending after 549 had been disposed of during the preceding 12 months. But on June 30 of this year, despite the doubling of the number of appeals filed, only 315 land cases were pending. This result has been accomplished by the disposition of 1,110 land cases during a single year, a tremendous undertaking under any circumstances and particularly in view of the unusual amount of other legal work which the business of the Department has involved.

One of these appeals, *United States v. California et al.* (A-17366), is perhaps the most important single case considered by the legal officers of the Department in recent years. This decision, commonly called the "Section 36 Case", asserts the validity of the title of the United States to lands within the Elk Hills oil field in California, one of the most valuable oil-producing areas in the United States. Preparation of the opinion required the examination of some 10,000 pages of testimony and hundreds of exhibits in order that findings might be made upon controverted issues of fact concerning the mineral character of the area as it appeared 30 years ago.

During the fiscal year consent decrees have been entered in 18 mineral relief cases. Seventeen cases of this type were dismissed by the Supreme Court of the District of Columbia either after hearing upon petition and answer or upon motion of the Secretary of the Interior. The Secretary of the Interior has been defendant in several suits for mandamus or for injunction which have been in process of litigation in the courts of the District of Columbia during the year. In all of these cases the Solicitor has represented the Secretary.

The Solicitor has also assisted special counsel for the people of Puerto Rico in the representation of the interests of Puerto Rico in cases before the Circuit Court of Appeals for the First Circuit or appeal from the courts in Puerto Rico. In addition, attorneys attached to the several bureaus of the Department, particularly the Indian Office and the Reclamation Service, have assisted the Department of Justice in the conduct of litigation involving interests of the Department.

During the first session of the Seventy-fourth Congress the legislative section of the office of the Solicitor has prepared or assisted in the preparation of approximately 115 bills, has prepared or reviewed approximately 1,140 reports and letters dealing with legislation, and has represented the Department before congressional committees on

some 70 occasions. However, much of the basic work of preparing a departmental legislative program must be done when Congress is not in session. As a condition precedent to the preparation of any important legislative measure and to the exposition of such a bill to congressional committees a thorough exploration of all pertinent factual and legal aspects of the proposal must be conducted. This requires investigation and study in Washington and not infrequently in the field. In anticipation of questions which may be raised, potential constitutional issues must be examined in many cases and opinions must be written for reference as occasion may arise.

Among the bills sponsored by the Department and enacted during the first session of the Seventy-fourth Congress, two are mentioned particularly. Public, No. 292 is an act authorizing the Secretary of the Interior to acquire, restore, and preserve historic sites and properties. No longer will it be necessary to rely upon public-spirited and wealthy individuals to preserve and restore historical landmarks of the United States. Public, No. 297½ is an act abolishing the present unsatisfactory permit system of mining upon the public domain and substituting a more equitable system of leasing, under which the United States, the States, and the reclamation fund will receive the royalty benefits which have heretofore accrued in large measure to middlemen who contributed little or nothing toward the development of the oil resources of the Nation.

It is noteworthy that the legal business of the General Land Office has increased rather than decreased since the general public land withdrawals effected by the Executive orders of November 26, 1934, and February 5, 1935. In fact, the promulgation of those orders has had the effect of stimulation of recourse by claimants to every equity or alleged equity and to every legal right of appeal possible in order to make their claims relate back to some time prior to the withdrawals.

The Solicitor has supplied requisite legal services to aid Indian tribes in drafting constitutions, bylaws and charters authorized by the Indian Reorganization Act of June 18, 1934. At the same time members of the immediate staff of the Solicitor and attorneys in the Indian Office have devoted much time to a comprehensive revision of the complicated and uncoordinated departmental regulations governing the conduct of Indians. New rules of May 31, 1935, represent a thorough revision of the entire body of regulations concerning Indian probate matters. A similar revision of Indian law and order regulations has been completed. Work continues on grazing, leasing, and other regulations. In addition, Indian liquor laws and regulations are being accorded particular study with a view to recommending legislative and administrative action for the more effective control of liquor traffic upon Indian reservations.

In the initiation, organization, construction, and management of some 40 reclamation projects the condemnation and purchase of land and rights-of-way, the organization of irrigation districts and water users' associations, the negotiation, execution, and performance of repayment contracts and the prosecution of litigation for the adjudication of water rights continue to require extensive, varied, and important legal services. As was pointed out a year ago in the annual report of the Solicitor, the current program of the Bureau of Reclamation, financed principally by emergency public-works allotments, is almost as extensive as the aggregate of operations heretofore undertaken by the Bureau during the first 30 years of its existence. The increase in reclamation work has caused the legal business of the Bureau to increase 5 or 6 fold during the last 2 years. Yet, the legal staff attached to the Bureau has not been increased at all. The present staff is carrying a burden greatly in excess of reasonable assignment.

The following statistical summary of major features of the work of the Solicitor, exclusive of the business dispatched by legal sections attached to particular bureaus, has been compiled for convenient reference:

	Land decisions	Opinions of Solicitor ¹	Indian matters	Miscel- laneous matters
Pending July 1, 1934.....	407		170	1,077
Received during year.....	1,018		5,699	10,123
Total.....	1,425		5,869	11,200
Disposed of during year.....	1,110	237	5,663	11,378
Pending June 30, 1935.....	315	77	206	200

¹ Prior to this year opinions of the Solicitor have been included in "Miscellaneous matters."

Miscellaneous matters include the following:

Reports on legislation.....	1160
Contracts for the erection of buildings, road construction and repairs, supplies, etc.....	2833
Cases prepared for submission to the Board of Equitable Adjudication....	987
Oil and gas matters:	
Leases.....	50
Prospecting permits:	
Granted.....	1723
Reinstated.....	8
Assignments.....	200
Extensions of time.....	2354
Canceled.....	271

Coal matters:

Prospecting permits-----	73
Licenses-----	35
Leases-----	28

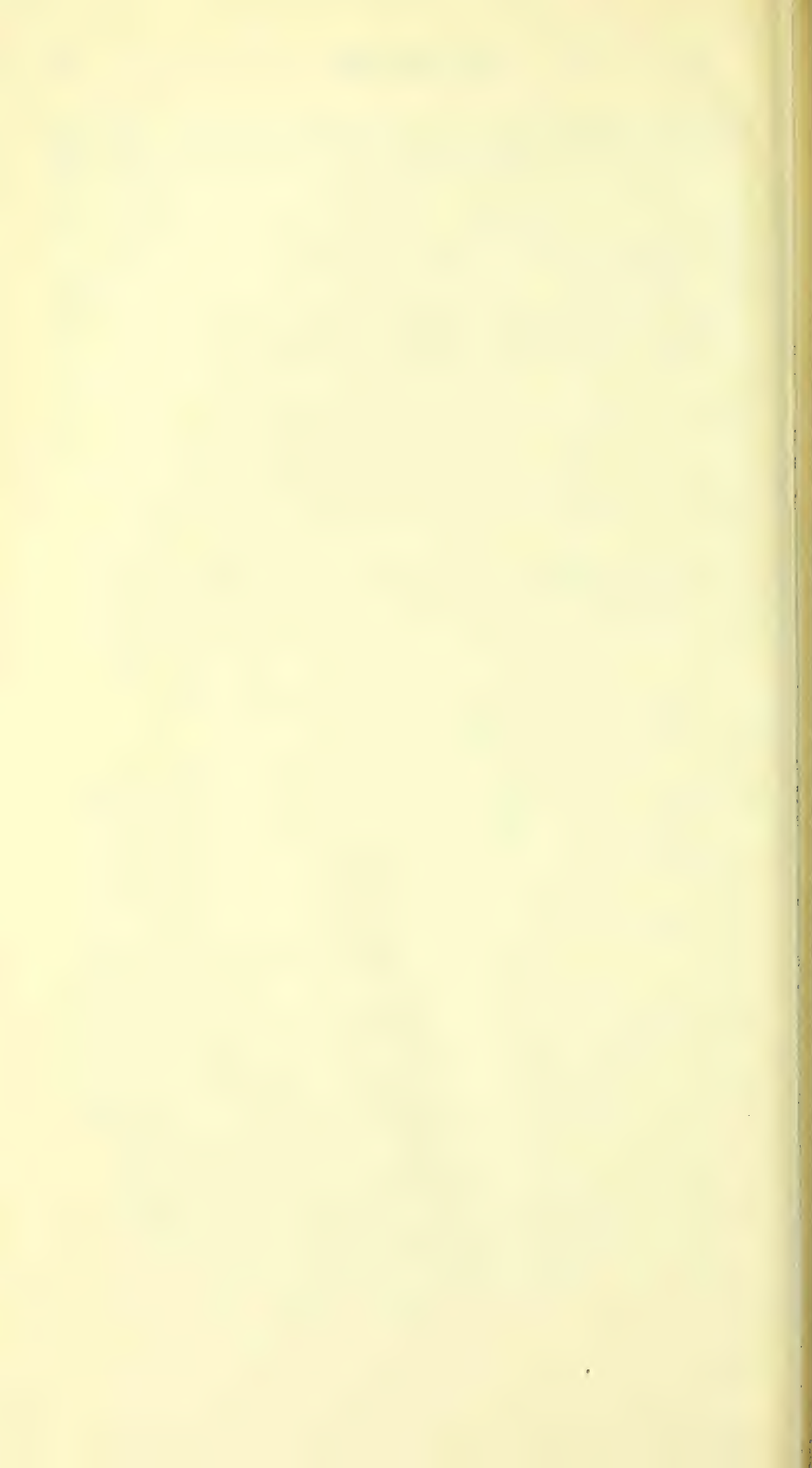
Potash matters:

Prospecting permits extended-----	8
Permits canceled-----	4

Sodium matters:

Prospecting permits-----	14
Leases-----	1

Sulphur matters: Prospecting permits-----	4
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DIVISION OF INVESTIGATIONS

LOUIS R. GLAVIS, *Director*

The regular annual appropriation for this Division to conduct investigations for the Interior Department for the fiscal year 1935 was \$362,560.

The average number of active field investigators, exclusive of special agents in charge, was 75; average number of clerks employed in divisional offices, 20; total force employed, including special agents in charge, and the Washington office, 100.

Due to the activities of field investigators, \$30,638.65 was collected and turned into the Treasury and 224,214.59 acres were restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

INVESTIGATIONS

On July 1, 1934, there were pending field investigation 8,476 cases. During the year 8,237 additional cases were received; 8,546 cases investigated, reported, and closed, leaving 8,167 cases pending investigation. Of the reports submitted, 2,512 were adverse and 6,034 favorable.

On the recommendation of this Department 27 civil suits were brought by the Department of Justice. Twenty-one cases were tried, of which 18 were won and 3 lost. As a result of the suits, \$12,808.35 was recovered and 1,480 acres restored to the public domain. The criminal cases handled in the Division consisted of: Conspiracy, 21; criminal, 11; intimidation, 2; and unlawful enclosure, 18. Of the criminal cases tried 3 resulted in conviction and prison sentence was imposed in each case.

The cases investigated by the Division for the various bureaus of the Department, other than the General Land Office, were as follows: Office of Indian Affairs, 126; National Park Service, 25; Bureau of Reclamation, 7; miscellaneous, 7; Geological Survey, 4.

FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

The Director of Investigations conducts all investigations for the Public Works Administration. His staff personnel on June 30, 1935,

including the national office at Washington, consisted of 10 special agents in charge, 185 special agents, and 125 other employees.

Cases investigated by the Division of Investigations relate to expenditure of Public Works' funds, collusion and fraudulent bidding where contractors and subcontractors are involved, wages and disputes arising from rates of pay, irregularities in the employment of labor and use of materials, code violations, underpayment of employees, repayment to contractors of wages of employees, contracts relating to housing projects, governmental personnel, and misconduct of officers and employees of the Public Works Administration, activities of the National Reemployment Service and other governmental agencies, to which Public Works' funds are allotted.

These investigations, having to do with the allotment and expenditure of large sums of money, enabled the administrative officers to uncover numerous frauds and irregularities and prevent substantial losses to the Government. It is notable that a saving of \$64,449,927.74 was effected by the Public Works Administration through activities of the Division of Investigations since inception of the administration in 1933.

The administrative expense of the Division of Investigations from the beginning to June 30, 1935, amounted to \$1,337,350.90, or a fraction slightly more than 2 percent of the total amount saved.

This saving was accomplished by and through investigations covering such items as cancelation or rescission of contract bids and awards where fraud or collusion was found to exist, rescission of allotments for loans and/or grants due to irregularities or fraudulent representation; lack of economic soundness in projects investigated, inadequate financial ability of the borrower or his inability to liquidate loans, and the use of insufficient or inferior material in construction work.

There also was included penalties imposed on contracts for violation of the 8-hour law on Federal projects, reduction in allotments where it was found that the borrower had included excessive amounts in estimates covering overhead and engineering fees, reduction of allotments due to fictitious estimates and excessive appraisals covering the purchase of lands for projects sites, and savings effected by requiring a change in the method of construction from force account to a contract basis.

The Division of Investigations also effected other savings not shown in this total. One of the more important of these was reimbursement of wages to labor where such pay was wrongfully withheld by contractors through what has been designated as the "kick-back racket." It is estimated that this saving to labor by such reimbursements amounted to \$258,331.14.

Thirteen thousand seven hundred and twenty-two cases were investigated and reported by special agents of the Division of Investigations; 10,520 cases were reported favorably and 3,202 cases were reported adversely. Included in the foregoing were 85 criminal prosecutions, resulting in 14 cases receiving court action, 16 cases resulting in indictments, and prison sentences were imposed in six cases.

The Director of Investigations conducted 107 investigations for the National Reemployment Service, Department of Labor, and 400 investigations were made for the Director of the Contract Division of the National Industrial Recovery Administration, involving code violations on P. W. A. projects.

OIL ENFORCEMENT

The Director of Investigations performed all investigations, under the supervision of the Secretary of the Interior in his capacity of administrator for the petroleum industry, in the enforcement of the provisions under the regulations pursuant to section 9c of the National Industrial Recovery Act, relating to the transportation in interstate commerce of oil produced in violation of State regulations, until the United States Supreme Court in the case of the Panama Refining Co., et al., dated January 7, 1935, held these regulations to be unconstitutional, and in the enforcement of the provisions of the Code of Fair Competition for the Petroleum Industry, until the decision in the case of A. L. Schechter Poultry Corporation and others, dated May 27, 1935, declared the code unconstitutional.

OIL CODE

The personnel until June 15, 1935, the date the code work ceased, consisted of 13 special agents in charge, 2 acting special agents in charge, 78 special agents, and 85 employees, inclusive of the personnel in the Washington office.

The total number of cases investigated was 8,885, of which 3,065 were reported on and closed. Of the total number of cases investigated, 420 were recommended for prosecution and in 341 cases prosecution was begun.

INVESTIGATIONS UNDER SECTION 9C

The investigations were carried on by the Director of Investigations by a personnel of 1 agent in charge, 23 special agents, and 14 clerks. The total number of cases investigated was 1,223, resulting in 25 cases prosecuted. Under section 35 of the Criminal Code, as amended, 11 prosecutions. Civil cases, resulting in court action, 2.

CONNALLY OIL ACT

The Director of Investigations conducted investigations in all States other than Texas of violation of the Connally Act of February 22, 1935 (Public, No. 14), relating to interstate and foreign commerce in petroleum and its products by prohibiting the shipment in such commerce of petroleum and its products produced in violation of State law.

The existing personnel of the Division of Investigations engaged in this work comprises an office force in Washington and a field force of 74 employees. The total number of cases investigated was 18, resulting in 4 recommended for prosecution and a permanent injunction secured in 1 case.

MARINE UNIT

The investigations of cases arising under the regulations under section 9c and the Connally Oil Act were made in conjunction with a marine section of 1 special agent in charge, 2 special agents, and 15 employees, operating a number of patrol boats, to inspect tanker cargoes of petroleum and petroleum products. Reports are made by the masters of all vessels transporting petroleum or petroleum products thereof, in the loading and discharging of cargoes, amounting to a total of 284,054,468 barrels, moved in interstate commerce from the State of Texas. The reports, approximating 125 per day, constitute the first attempt in the history of coastwise commerce for a governmental agency to secure an accurate record of coastwise and intercoastal movements of these products. The information is valuable to the Federal Government in the collection of taxes due on petroleum products.

CIVIL WORKS ADMINISTRATION

Investigations of irregularities in expenditures of funds allotted to the Federal Relief Administrator for civil relief, by the Public Works Administration, were conducted by the Director of Investigations until February 14, 1934. While there were no investigations of new cases during the past fiscal year, there were 23 cases pending with the United States attorneys for prosecution; 6 indictments secured; 5 cases resulted in court action; 4 cases involved prison sentences; 8 dismissed; and 9 are still pending action of the United States attorneys and the Department of Justice.

DIVISION OF GRAZING

(F. R. CARPENTER, Director)

The act of June 28, 1934 (48 Stat. 1269), commonly known as the "Taylor Grazing Act", is a new development in the national policy for conservation of natural resources in accord with the traditions of the Department of the Interior. The purposes of the new law as set forth in its title are "To stop injury to the public grazing lands by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement, and development; to stabilize the livestock industry dependent upon the public range; and for other purposes."

The first step in the administration of this law was taken July 9, 1934, when Secretary Ickes designated representatives of the Department of the Interior to hold a series of preliminary conferences in the West. The delegation named was headed by Assistant Secretary Oscar L. Chapman and included Fred W. Johnson, Commissioner of the General Land Office; Rufus G. Poole, Assistant Solicitor; Hugh H. Bennett, Director Soil Studies; T. C. Havell, General Land Office; J. H. Favorite, Division of Investigations; John F. Deeds, Geological Survey; and Dr. Wendell Lund, acting in a secretarial capacity.

These representatives held public hearings as follows: July 23, Salt Lake City, Utah; July 26, Boise, Idaho; July 31, Billings, Mont.; August 2, Casper, Wyo.; August 6, Glenwood Springs, Colo.; September 14, Albuquerque, N. Mex.; September 19, Prescott, Ariz.; September 24, San Francisco, Calif.; September 26, Reno, Nev.; and September 28, Klamath Falls, Oreg.

In his report on these conferences Assistant Secretary Chapman states that ranchmen throughout the West realize that the vast public ranges which are being overgrazed and depleted must be protected and restored or they will soon be replaced by acres of desert land. They realize that it is to their own interest, as well as to the interests of their States and the Nation, that these lands be protected by a uniform policy.

Meanwhile, in order to handle the multitude of inquiries and other details incident to the administration of this law, the Secretary, on July 17, named Mr. N. F. Waddell, special agent, Division of Investigations, Acting Director in Charge of Grazing, pending the appointment of a director to handle the grazing program. The General Land Office and Geological Survey were directed to cooperate

with him. On September 7, 1934, the Secretary appointed Mr. F. R. Carpenter, of Hayden, Colo., Director of Grazing.

The new Director of Grazing was authorized, with the concurrence of the agencies concerned and the approval of the Secretary, to select such assistants as were required for the administration of the Taylor Grazing Act from the staffs of the Geological Survey, the General Land Office, and the Division of Investigations. At the close of the year a total personnel of 35 people were thus assigned to the Division—21 from the Geological Survey, 8 from the Division of Investigations, and 6 from the General Land Office. The salaries and expenses of the Director and detailed employees up to June 30, 1935, amounted to approximately \$110,000. The salaries and expenses included in this figure cover only the period of detail, which for the most part was less than half of the fiscal year. It is estimated that an additional expense of not less than \$100,000 was incurred by the cooperating agencies.

DENVER CONFERENCE

On December 13, 1934, the Secretary announced that a series of conferences would be held in Denver, Colo., February 11 to 16, to discuss questions of national policy in the exchange and use of public lands as they may be affected by the grazing regulations. Officials from the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington, and Wyoming were asked to attend these conferences. The first two days were devoted to State lands, the second two days to fish and game problems, and the last two days to grants in aid of railways and highways.

On February 12, 1935, Secretary Ickes spoke before a general assembly of all persons attending the conference. The Secretary discussed the abuses inherent in unrestricted grazing on the open public domain and the benefits to be obtained from prudent use of the land under the terms of the Taylor Grazing Act. He besought the intelligent and whole-hearted support of western stockmen to the end that depleted ranges might be restored to normalcy.

The State land representatives adopted a series of resolutions concerning the administration of the public domain with particular reference to grants in aid of the public schools and for other purposes. One of the primary requests from the State land agents concerned facilitation of exchanges. To accomplish this purpose the President signed the Executive order of May 20, 1935, modifying Executive order of November 26, 1934.

OBJECTIVES OF THE TAYLOR GRAZING ACT

The primary task in the administration of the public domain under the Taylor Grazing Act contemplates establishment of grazing districts where the area of public land is adequate to warrant such action for (1) conservation of natural resources, and (2) stabilization of the livestock industry dependent upon the range. Over a long period of years grazing use in excess of carrying capacity has caused a progressive deterioration of that land through displacement of the more palatable forage plants by species of low palatability or of no worth for grazing. In this transition natural erosion processes have been accelerated, causing loss of soil fertility, and in places even actual removal of soil cover, thus rendering the land incapable of producing a density of any vegetative growth equivalent to natural conditions. This deterioration has been in progress over a period of 35 to 40 years.

Conservation of natural resources under these conditions requires not only prevention of further waste but restoration of the land resources. By the halting of all land-use activities nature could accomplish this restoration unaided, but such drastic action would create an intolerable economic disturbance throughout the West. Accordingly the Department is planning to accomplish restoration of the land by other means to the utmost practicable limit.

A wide variety of range restoration projects will be undertaken as part of the Emergency Conservation Work Program of the Division now being performed by the Civilian Conservation Corps. These projects will include an extensive program of water development to permit a more even distribution of the livestock on the public range. Eradication of rodents will be undertaken to reduce their consumption of the feed resources. Drift fences will be constructed to permit more effective range management, and in some localities trails will be constructed to make present inaccessible feed supplies available for use. Small sample plots will be enclosed with rodent-proof fences to furnish definite indication of the rate of restoration obtainable by natural processes and the character of the natural vegetation. Erosion control will be included in the program where necessary, as well as the eradication of poison plants. Such activities, with a limitation of the livestock population to accord with the feed resources actually available, as well as to proper seasons of use will comprise the initial activities toward restoration of normal range conditions.

SPECIAL EXECUTIVE ORDERS

On November 26, 1934, the President signed an Executive order withdrawing for classification all public lands in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming. The

order was limited to these States because they contained the only areas which were then regarded as properly subject to inclusion in grazing districts. The withdrawal was made in furtherance of the organization of such districts, the exchange of State-owned and privately owned lands, the sale or lease of isolated disconnected tracts, as well as the other purposes of the Taylor Grazing Act. The order declares that classification of the lands involved is necessary for the effective accomplishment of its purposes and that the lands are being reserved pending completion of such classification work, unless sooner revoked by the President or the Congress.

By Executive order of February 5, 1935, the public lands in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, Washington, and Wisconsin were withdrawn for classification and pending determination of the most useful purpose to which said lands may be put in furtherance of the land program of the Federal Emergency Relief Administration and for the conservation and development of natural resources. Where that program is involved or can be aided by the organization of grazing districts it is anticipated that such districts will be organized under the Taylor Grazing Act.

By Executive order of May 20, 1935, the President so amended Executive order of November 26, 1934, as to make it applicable to all lands within the States involved therein "upon the cancelation or release of prior entries, selections, or claims, or upon the revocation of prior withdrawals, unless expressly otherwise provided in the order of revocation." In the same order the Secretary of the Interior is authorized in his discretion and in harmony with the purposes of the Taylor Grazing Act of June 28, 1934, to accept title to base lands in exchange for other lands subject to exchange under the terms of that act.

ORGANIZATION OF GRAZING DISTRICTS

Pursuant to the requirements in the Taylor Act for a public hearing prior to the organization of a grazing district public notices were issued for such hearings as follows:

Sept. 17-----	Grand Junction, Colo.	Jan. 9-----	Mountain Home, Idaho.
Oct. 1-----	Bakersfield, Calif.	Jan. 22-----	Monticello, Utah.
Oct. 5-----	Alturas, Calif.	Jan. 25-----	Moab, Utah.
Oct. 11-----	Klamath Falls, Oreg.	Jan. 29-----	Castle Dale, Utah.
Oct. 16-----	Burns, Oreg.	Feb. 4-----	Roswell, N. Mex.
Oct. 22-----	Salt Lake City, Utah.	Feb. 8-----	Deming, N. Mex.
Oct. 31-----	Alamogordo, N. Mex.	Feb. 11-----	Santa Fe, N. Mex.
Nov. 2-----	Vernal, Utah.	Feb. 14-----	Durango, Colo.
Dec. 4-----	Malta, Mont.	Feb. 19-----	Montrose, Colo.
Dec. 11-----	Ekalaka, Mont.	Feb. 26-----	Grand Junction, Colo.
Dec. 18-----	Milford, Utah.		

The above-listed hearings involved relatively small grazing units sponsored by local interests with but little reference to broad regional plans. Conflicts in areas requested for inclusion in adjoining districts were inevitable as well as a multiplicity of hearings in which the problems, and often even the people involved, were substantially identical.

Accordingly, under date of December 1, a public notice was issued for a series of State-wide hearings to be held as follows:

Dec. 4.....	Malta, Mont.	Jan. 3.....	Bismarck, N. Dak.
Dec. 7.....	Billings, Mont.	Jan. 8.....	Rapid City, S. Dak.
Dec. 10.....	Casper, Wyo.	Jan. 14.....	Albuquerque, N. Mex.
Dec. 15.....	Vale, Oreg.	Jan. 17.....	Bakersfield, Calif.
Dec. 17.....	Boise, Idaho	Jan. 24.....	Reno, Nev.
Dec. 19.....	Salt Lake City, Utah	Jan. 28.....	Phoenix, Ariz.
Dec. 29.....	Montrose, Colo.		

Notice of the December 4 hearing at Malta, Mont., included in the foregoing list, is a duplication of a notice previously published.

At the State-wide hearings, after an explanation of the terms of the Taylor Grazing Act as applicable to the conditions in each locality, the need for subdividing the State into grazing districts comprising public-domain areas convenient and proper for administration, was given special emphasis. At these meetings State committees, composed of representative stockmen, were elected to recommend boundaries for such grazing districts.

Following the series of State-wide hearings the committees elected at such hearings considered the range problems of their respective States and recommended the establishment of 50 districts involving an aggregate area of approximately 142,000,000 acres of vacant, unreserved, unappropriated public land. The action of these committees was taken without reference to the provision in the existing law limiting the creation of such districts to 80,000,000 acres of vacant, unappropriated, unreserved public land. Accordingly, in the absence of further authority from the Congress, only 32 of the districts proposed could be established. The districts selected for establishment included areas in which range administration was most urgently needed and the lands were conveniently located for administration.

REGULATIONS FOR GRAZING DISTRICTS

Division of Grazing, circular no. 1, entitled "Rules providing for special elections for district advisors to assist in the management of grazing districts", was approved by the Secretary, April 23, 1935. Circular no. 2, entitled "Rules for the guidance of district advisors in recommending the issuance of grazing licenses", was approved

by the Secretary, May 31, 1935. These circulars contain the general regulations issued during the year for the administration of grazing districts.

Under circular no. 1, the services of local persons familiar with the range problems will be secured by a special election of district advisors from among the local stockmen to serve until plans are completed which contemplate a regular annual election. By this means the practical local viewpoint will be available at all times in the administration of the law. These advisors will receive no regular salary but will be paid \$5 a day for subsistence and necessary travel expenses. They will take the regular oath of office of a Federal official and will be the local governing agency as to all matters of a range regulatory nature concerning their particular district. The Interior Department will exercise necessary supervision and provide basic technical criteria for conservation of natural resources.

Circular no. 2 contains preliminary rules for allocating public range privileges and general rules governing the use of the land. This circular provides that until such time as land classification studies can be completed and the commensurate value of properties dependent upon the public range determined, only temporary revocable licenses will be issued. Furthermore, during this temporary period, established stockmen will be recognized upon the basis of their operations prior to the time the administration of the public range is inaugurated.

In the preparation of these regulations an effort has been made to take immediate steps for range regulation in a manner that would permit needed readjustments to be made gradually and on the basis of thorough investigations. Furthermore, some time must be allowed to permit all interested persons to file applications for grazing permits and for the examination and rating of such applications under the terms of the Taylor Act.

EMERGENCY CONSERVATION WORK

The enactment of the Taylor grazing law released the Interior Department from a ban on the use of Civilian Conservation Corps enrollees for range-improvement activities. This ban was placed by the Secretary because range improvement to facilitate grazing without regulation probably would increase the burden of overgrazing and the resultant waste of natural resources. In addition, therefore, to the organizing of grazing districts it has been necessary to inaugurate a program of range improvement.

The Division has been allotted the services of 60 camps with 12,000 enrollees for a comprehensive program of range work. The activities of these enrollees will be directed by persons competent to direct

such work projects as well drilling, construction of dams, trails, fences, etc., and other activities that may be needed in any locality. During the fiscal year these activities were largely limited to selecting camp sites, purchasing equipment, and developing work plans. A total of \$905,392.43 was expended.

The 60 camp sites selected are distributed by States, as follows: Arizona, 8; California, 3; Colorado, 5; Idaho, 6; Nevada, 11; New Mexico, 8; Oregon, 6; Utah, 10; Wyoming, 3.

The plans for the foregoing camps contemplate some changes in locations where climatic conditions preclude work during winter months. In order to keep such changes at a minimum, especially because only 7 camps were available at the beginning of the present summer season, very little work is being performed in the northern public-domain areas. It is anticipated that during the 1936 season a large number of camps will be moved to these northern areas.

CLASSIFICATION OF LANDS

On March 21, 1935, Acting Secretary Walters approved an order to establish in the administration of the Taylor Grazing Act a technical organization qualified to determine the surface utility of areas subject to the provisions of this law by transferring to the new organization the former Agricultural Division of the Conservation Branch, Geological Survey. The functions and responsibility for the duties formerly vested in the Agricultural Division were also transferred to the Division of Grazing. The transferred functions are assigned to the agricultural section of the Division of Grazing. During the period April 1, 1935, to June 30, 1935, these functions were restricted largely to office phases necessary to appropriate action on applications for agricultural classification and for designations under the stock-raising and enlarged homestead laws. Action was completed on 469 cases; 282 new cases were received, resulting in a reduction of 105 pending cases during this period. Office activities not otherwise indicated comprised the designation of 160 acres in 1 State as subject to the enlarged homestead act, and to the inclusion of 1,640 acres in 7 States in public water reserves; the exclusion of 160 acres in 1 State from such reserves, and net increase of the gross public water-reserve areas in 7 States to 508,228 acres. Recommendations for designations of lands under the enlarged and stock-raising homestead acts and the Nevada groundwater act were substantially terminated by the Executive orders of November 26, 1934, and February 5, 1935, withdrawing public lands for classification. Such designations are now being made only where necessary for the purpose of permitting the adjudication of homestead entries having valid claims established prior to the withdrawal.

On June 30, 1935, the outstanding designated area under the enlarged homestead act included 268,467,745 acres; the stock-raising homestead act, 102,429,247 acres; and the Nevada ground-water act 1,732,095 acres.

Status of grazing districts, July 30, 1935

State	No.	Established	Total acres	Publicland acres ¹
Arizona.....	1	(²)	3,450,000	1,505,200
California.....	1	Apr. 8, 1935	3,472,000	1,294,846
	2	do.....	3,950,000	577,308
Colorado.....	1	(²)	3,818,000	2,093,331
	2	Apr. 8, 1935	2,668,000	438,673
	3	do.....	3,980,000	1,416,870
	4	do.....	3,060,000	1,096,194
	6	(²)	2,461,000	1,408,252
Idaho.....	1	Apr. 8, 1935	9,150,000	4,181,445
Montana.....	1	(²)	8,418,000	1,624,235
	2	(²)	13,570,000	1,436,536
	3	Apr. 8, 1935	7,590,000	686,523
	4	Apr. 9, 1935	667,000	144,887
Nevada.....	1	Apr. 8, 1935	10,672,000	7,984,977
	2	(²)	13,202,000	9,539,271
New Mexico.....	3	(²)	7,590,000	2,692,940
	4	Apr. 8, 1935	5,900,000	2,437,649
	5	do.....	1,890,000	1,110,926
	6	do.....	12,440,000	2,533,933
Oregon.....	1	do.....	171,000	96,814
	2	(²)	9,131,000	4,960,676
	3	Apr. 8, 1935	4,654,000	2,785,957
	4	Apr. 3, 1935	2,903,000	1,717,962
Utah.....	1	Apr. 8, 1935	4,714,000	1,186,806
	2	do.....	6,256,000	2,868,422
	3	do.....	6,532,000	3,424,472
	4	do.....	4,186,000	2,065,080
	5	May 7, 1935	4,255,000	3,774,186
	6	June 22, 1935	6,912,000	3,541,069
	7	May 7, 1935	4,600,000	2,584,360
	8	June 22, 1935	945,000	600,719
Wyoming.....	1	Mar. 23, 1935	4,370,000	1,246,181
Total.....			177,607,000	75,062,700

¹ Includes vacant, unreserved, unappropriated public land only; figures subject to revision.

² Establishment delayed pending adjustment of conflicts with other uses.

General summary of cases, record for fiscal year, 1934-35

Class of case	Pend- ing July 1, 1934	Re- ceived July 1, 1934 to Apr. 1, 1935	Re- ceived Apr. 1, to June 30, 1935	Total ¹	Acted on July 1, 1934 to Apr. 1, 1935	Acted on Apr. 1, to June 30, 1935	Total acted on	Pend- ing June 30, 1935	Record since re- ceipt of first case	
									Re- ceived ²	Acted ³
Agriculture classifica- tion.....	41	94	186	321	83	21	104	217	1,764	1,547
Miscellaneous classi- fication.....			1	1				1	1	
Enlarged.....	67	56	7	130	53	4	57	73	58,003	57,930
Stock raising.....	1,809	1,442	88	3,339	1,374	444	1,818	1,521	144,005	142,484
Ground water.....	2	1		3	3		3		988	988
Taylor Grazing Act:										
Sec. 7.....			1	1				1	1	
Sec. 8.....										
Sec. 14.....			1	1				1	1	
Sec. 15.....										

¹ Includes cases transferred from Geological Survey.

² Includes all cases received in Geological Survey prior to Apr. 1, 1935.

³ Includes all cases acted on in Geological Survey prior to Apr. 1, 1935.

Public-water reserves

includes areas withdrawn under the act of June 25, 1910 (41 Stat. 1063), as amended by the act of Aug. 24, 1912 (37 Stat. 497), and reserved for public use of springs or water holes in accordance with the provisions of sec. 10 of the act of Dec. 29, 1916 (39 Stat. 862), or for watershed protection, drainage reservoirs, or other similar miscellaneous public purposes involving water conservation)

State	Reserved prior to Apr. 1, 1935	Eliminated prior to Apr. 1, 1935	Reserves outstanding prior to Apr. 1, 1935	Reserved during fiscal year ¹	Elimi- nated during fiscal year ¹	Reserves outstanding June 30, 1935
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Nebraska.....	17		17			17
Arizona.....	27,807	3,502	24,305			24,305
California.....	233,452	11,030	222,422	120		222,542
Colorado.....	16,030	1,180	14,850			14,850
Idaho.....	19,312	490	18,822			18,822
Montana.....	15,129	1,792	13,337	480		13,817
Nevada.....	20,476	3,615	16,861	160		17,021
New Mexico.....	14,841	3,665	11,176	120		11,296
Oregon.....	40,189	1,568	38,621	120		38,741
South Dakota.....	240		240			240
Utah.....	52,076	7,756	44,320	40		44,360
Washington.....	1,240		1,240			1,240
Wyoming.....	115,997	15,460	100,537	600	160	100,977
Total.....	556,806	50,058	506,748	1,640	160	508,228

¹ April, May, and June, inclusive.

Summary of enlarged homestead designations

Areas classified as arid and nonirrigable, residence by entrymen required:

Act of Feb. 19, 1909 (35 Stat. 639), applicable to Arizona, Colorado, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Act of June 17, 1910 (36 Stat. 531), applicable to Idaho.

Act of June 13, 1912 (37 Stat. 132), applicable to California, North Dakota.

Act of Mar. 3, 1915 (38 Stat. 953), applicable to Kansas.

Act of Mar. 4, 1915 (38 Stat. 1163), applicable to South Dakota.

Areas classified as arid, nonirrigable, and lacking domestic water supply, residence by entrymen not required:

Act of Feb. 19, 1909 (35 Stat. 639), applicable to Utah.

Act of June 17, 1910 (36 Stat. 531), applicable to Idaho.

State	Designa- tions prior to Apr. 1, 1935	Cancela- tions prior to Apr. 1, 1935	Designa- tions out- standing prior to Apr. 1, 1935	Designa- tions during fiscal year ¹	Cancela- tions during fiscal year ¹	Designa- tions out- standing June 30, 1935
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	31,536,528	13,420,889	18,115,639	160		18,115,799
California.....	13,388,348	2,258,403	11,129,945			11,129,945
Colorado.....	33,985,695	4,773,180	29,212,515			29,212,515
Idaho:						
Total.....	13,764,286	7,807,295	5,956,991			5,956,991
Nonresidence.....	575,507	4,233	571,274			571,274
Kansas.....	653,960		653,960			653,960
Montana.....	53,524,401	246,088	53,278,313			53,278,313
Nevada.....	50,219,551	3,581,037	46,638,514			46,638,514
New Mexico.....	43,865,711	8,990,698	34,875,013			34,875,013
North Dakota.....	12,284,253	3,848	12,280,405			12,280,405
Oregon.....	21,288,362	11,542,577	9,745,785			9,745,785
South Dakota.....	16,344,433	348,170	15,996,263			15,996,263
Utah:						
Total.....	11,760,057	5,360,117	6,399,940			6,399,940
Nonresidence.....	1,659,458	510,463	1,148,995			1,148,995
Washington.....	6,661,972	251,842	6,410,130			6,410,130
Wyoming.....	29,799,169	12,024,997	17,774,172			17,774,172
Total.....	339,076,726	70,609,141	268,467,585	160		268,467,745

¹ April, May, and June, inclusive.

Summary of stock-raising homestead designations

Areas classified as nonirrigable, nontimbered, chiefly valuable for grazing and raising forage crops, and of such character that 640 acres are reasonably required for the support of a family. Act of Dec. 29, 1916 (39 Stat. 862)

State	Designations prior to Apr. 1, 1935	Cancellations prior to Apr. 1, 1935	Designations outstanding prior to Apr. 1, 1935	Designations during fiscal year ¹	Cancellations during fiscal year ¹	Designations outstanding June 30, 1935
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Arizona.....	14,395,025	1,040,814	13,354,211			13,354,211
Arkansas.....	1,280		1,280			1,280
California.....	8,312,631	32,400	8,280,231			8,280,231
Colorado.....	9,692,518	2,822,507	6,870,011			6,870,011
Florida.....	480	480				
Idaho.....	5,853,059	2,824,498	3,028,561			3,028,561
Kansas.....	117,639		117,639			117,639
Michigan.....	3,571		3,571			3,571
Minnesota.....	80		80			80
Mississippi.....	200		200			200
Montana.....	16,252,918	52,321	16,200,595			16,200,595
Nebraska.....	219,476		219,476			219,476
Nevada.....	693,273	3,120	690,153			690,153
New Mexico.....	32,335,015	4,063,536	28,271,479			28,271,479
North Dakota.....	426,371		426,371			426,371
Oklahoma.....	93,608		93,608			93,608
Oregon.....	6,594,875	3,413,748	3,181,127			3,181,127
South Dakota.....	6,566,069	550	6,565,519			6,565,519
Utah.....	2,368,419	851,895	1,516,524			1,516,524
Washington.....	726,856	1,294	725,562			725,562
Wyoming.....	21,669,339	8,786,290	12,883,049			12,883,049
Total.....	126,322,700	23,893,453	102,429,247			102,429,247

¹ April, May, and June, inclusive.

DIVISION OF GEOGRAPHIC NAMES

(GEORGE C. MARTIN, *Executive Secretary*)

The Division of Geographic Names was in process of organization on July 1, 1934.

The Division was established by the Secretary of the Interior on June 16, 1934, in consequence of Executive Order 6680, April 17, 1934, whereby the United States Geographic Board was abolished and it was—

further ordered that all of the functions of said Board, together with its chairman, secretary, and clerk-stenographer, records, supplies, equipment, and property of every kind, and unexpended balances of appropriations, be, and they are hereby, transferred to the Department of the Interior to be administered under the supervision of the Secretary of the Interior.

From August 1, 1934, following the retirement, on July 31, 1934, of Mr. Frank Bond, who had been chairman of the former board, until an advisory committee was appointed on September 30, 1934, the work of the Division was in charge of Mr. John J. Cameron, who had been secretary of the former board, and who was appointed assistant to the executive officer, Division of Geographic Names, on June 16, 1934.

On September 30, 1934, an advisory committee on geographic names was appointed by the Secretary of the Interior, who directed that the advisory committee "will function relatively in the same capacity as the old United States Geographic Board"; that an executive committee, appointed October 17, 1934, and consisting of three members of the advisory committee, "will be charged with the duty of keeping the machinery running in an efficient manner"; and that "Mr. John J. Cameron will serve as acting executive secretary."

Under the foregoing arrangement, the work of the Division, in its broader aspects, was directed by the executive committee, while Mr. Cameron was responsible for the administrative routine and investigative activities of the office of the Division. Decisions on geographic names, up to their final approval by the Secretary of the Interior, were made by the executive committee. The advisory committee, as a whole, delegated most of the matters involving decision on individual geographic names to the executive committee,

and reserved for its own activity chiefly the broader problems of procedure and nomenclature.

The organization outlined above continued until June 24, 1935, when George C. Martin was appointed as executive secretary of the Division of Geographic Names, and when Mr. Cameron resumed his former duties as assistant to the executive officer.

The advisory committee held three meetings during the year, in which there was formulation of organization and general policy, discussion and adoption of general rules and procedure in nomenclature, and approval of special rules concerning the spelling of foreign names, especially of Russian names in Alaska. The use of the possessive form in geographic names was also considered.

The executive committee held 21 meetings during the year at which 214 names were approved. In addition to the names that were automatically rejected by the approval of the above, 15 other new names were rejected as unsuitable for one reason or another, with a request that unobjectionable names be submitted as substitutes. Six of the rejected names were disapproved because they were proposed in honor of living persons. In the case of all new names, evidence was required as to the fact that the persons after whom the features were to be named were no longer living. In addition to the above, there was consideration, without final action, of 58 names, some of which were approved in subsequent meetings.

There was submitted for publication at the close of the fiscal year the manuscript of a report containing all decisions rendered between July 1, 1934, and June 30, 1935, and entitled "Decisions of the Advisory Committee on Geographic Names, No. 1." This report includes the 214 decisions noted above and also 53 decisions that were rendered but not published by the former board, and that were reaffirmed by the advisory committee, making 267 names in all that were approved.

The successful accomplishment of the work of the Division of Geographic Names is dependent on close and cordial cooperation with all the map-making and map-using departments of the Federal Government, with the State geographic boards and with other State and municipal officers and organizations, and with a large number of private investigators of local geography, local history, and other subjects that concern geographic names. Cordial cooperation has been maintained with all of these sources of help, and is gratefully acknowledged.

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

(ERNEST GRUENING, *Director*)

The Division of Territories and Island Possessions was created by Executive Order No. 6726, issued by the President on May 29, 1934, and effective 60 days thereafter. This order provided for the transfer of all functions pertaining to Puerto Rico previously vested in the Bureau of Insular Affairs, War Department, to the Division of Territories and Island Possessions to be administered under the supervision of the Secretary of the Interior. In accordance with the intention of the order to centralize and coordinate territorial affairs, the activities pertaining to Alaska, Hawaii, and the Virgin Islands, already under the jurisdiction of the Department of the Interior, were transferred to the new Division. These activities included not only the general supervision of the respective governors' offices, but also The Alaska Railroad, The Alaska Road Commission, Alaska reindeer, Alaska insane, the Virgin Islands Co., the Government-owned Bluebeard Castle Hotel at St. Thomas, Virgin Islands, Puerto Rico Hurricane Loan Relief Section, and the Hawaiian Homes Commission.

During the year the Division functioned effectively in cooperation with the Federal Emergency Relief Administration in establishing a farming community at Palmer, Alaska. This is generally referred to as the Matanuska Valley colonization project. Two hundred families on relief rolls, including approximately 1,000 people, were selected from the States of Michigan, Minnesota, and Wisconsin, and colonized in Alaska.

A fire in the early fall of 1934 practically wiped out the city of Nome, Alaska. Through the efforts of the Division of Territories and Island Possessions, the Federal Emergency Relief Administration made \$50,000 available for emergency-relief purposes; funds and the services of the American Red Cross were also promptly secured; and a representative of the Public Works Administration was sent from Washington by airplane to Nome, Alaska, to work out a reconstruction program for the stricken city.

An interdepartmental committee on Alaska under the chairmanship of the director of the Division of Territories and Island Pos-

sessions was created by the President to work out a plan for the coordination of Federal activities in the Territory. This committee held several meetings dealing with the colonization project, road building, air-field construction, geological service, fisheries, etc., and it is believed that a constructive long-range program for colonization and development of Alaska's vast natural resources will result.

The Division has been active in supervising the administration of the Government of the Virgin Islands and in formulating a program for the economic and social rehabilitation of the people living in the islands. This program, which was well under way, embraces subsistence homesteads, restoration of the sugar and rum industries to the position of importance which they occupied in previous years; establishment of a number of small industries; road building, etc. The Government-owned Bluebeard Castle Hotel was completed during the year and opened to the public on January 1, 1935. The first months of its operation were encouraging, and a comprehensive program for tourist development is planned for the future.

The economic and social problems of Puerto Rico are extremely formidable. The island is overpopulated and the masses of the people are prostrated. The Division is giving close attention to the situation and it is believed that a long-range program, financed by the Federal Government, for the economic and social rehabilitation of the people is the only practical solution. Such a program is being formulated and it is hoped that it will be made effective in the near future.

Hawaii is a well-organized and comparatively prosperous Territory, and while it has many problems, the local government is functioning very effectively in their solution. During the year the Division's activities in relation to Hawaii have been generally routine in character.

THE ADVISER ON NEGRO AFFAIRS

(ROBERT C. WEAVER, *Adviser*)

The activities of the office of the Adviser on Negro Affairs may be divided into two groups: Those matters which concern the Department of the Interior and the Public Works Administration; and those things which are outside the direct province of the Department of the Interior and the Public Works Administration.

Prior to the transfer of the Division of Subsistence Homesteads to the Rural Resettlement Administration, this office concerned itself with the participation of Negroes in the plans of the Subsistence Homesteads Division. Much time was spent by this office in keeping itself apprized of developments and directing to the attention of the Secretary the inactivity of the Subsistence Homesteads Division as it affected Negroes.

This office has called to the attention of the Administration of Public Works the discrimination against Negro labor which has occurred in the Public Works Administration. It has attempted to devise plans for the prevention of such discrimination and has succeeded in preparing a formula of *prima facie* evidence which has been accepted by the Administrator of Public Works.

The Adviser on Negro Affairs has consulted constantly with the Housing Division in the planning of housing projects in Negro slum areas. He has supplied the Housing Division with pertinent data from Census reports for the Negro population in some 30 cities, and has offered any other information which he has deemed useful. He also has made some suggestions as to policy insofar as it affected Negro participation in the program of the Housing Division.

The Adviser on Negro Affairs and his assistant have visited proposed sites for housing developments, have negotiated agreements for the employment of Negro workers on the projects, and have nurtured favorable opinion among colored people toward proposed housing developments. In order to facilitate the latter, this office not only has explained the program to the local residents, but it also has insisted upon integration of Negroes into the program. This has been accomplished through Negro representation on local sponsoring committees and the employment of colored architects on the projects.

The office of the Adviser on Negro Affairs has resubmitted the survey of Negro white-collar and skilled workers to the Works Progress Administration. The project has been revised several times and is now being reviewed by the statistical coordinator of the Works Progress Administration. The Adviser's office has been told that the proposed survey is receiving favorable consideration.

The office of the Adviser on Negro Affairs has concerned itself with relations between the Negro employees and the Department of the Interior and the Public Works Administration. This office has been particularly interested in the classification of Negro employees and the promotion of competent colored workers from the status of messengers to clerical positions.

The Adviser on Negro Affairs has published several articles and delivered speeches concerning the work of the Public Works Administration and the Department of the Interior as it affects Negroes. These articles and speeches have been intended to give colored citizens a true statement of what is being done in their behalf by the Public Works Administration and the Department of the Interior.

The Adviser on Negro Affairs has offered suggestions to other administrations concerning their relation with Negroes. Memoranda have been prepared and conferences have been held with the following agencies: (1) The Labor Department in relation to the proposed Security Act; (2) the Rural Resettlement Administration in relation to its general policy and its labor relation; (3) the Youth Administration in relation to its general policy and labor relations. This office also has furnished information to other agencies, including the N. R. A. and the F. E. R. A.

As a result of the precedent established by the Housing Division in the Public Works Administration, we believe that the Rural Resettlement Administration is going to take steps to set up standards which will do much to assure equitable distribution of employment between white and Negro workers.

WAR MINERALS RELIEF COMMISSION

(ROSCOE FERTICH, *Commissioner*)

Acting under the War Minerals Relief Act (40 Stat. 1272) as amended February 13, 1929 (40 Stat. 1166), the Secretary of the Interior made 13 awards and 3 disallowances during the fiscal year ending June 30, 1935.

Three awards, totaling \$49,649.71, carried over from the previous fiscal year, and six awards, totaling \$15,428.96, were paid through the Treasury deficiency appropriations bill (Public, No. 21, 74th Cong., 1st sess.) in the total amount of \$65,078.67. Seven awards, totaling \$10,455.88, were certified to the General Accounting Office to be paid through a future Treasury deficiency appropriation.

Record of cases filed under the act as amended Feb. 13, 1929

Total cases filed.....			348
Total cases dismissed by court (hearing, abatement, or failure to prosecute).....			33
Decisions by the Secretary of the Interior:			
	<i>Awards</i>	<i>Denials</i>	
To June 30, 1934.....	126	10	
July 1, 1934, to June 30, 1935.....	13	3	
	139	13	
	—	—	152
Cases pending:			
In Supreme Court of the District of Columbia.....			118
Decrees by Supreme Court of the District of Columbia pending in the War Minerals Relief Commission, June 30, 1935.....			45
			— 348

ACTION IN THE SUPREME COURT OF THE DISTRICT OF COLUMBIA

Eight cases were heard and dismissed by the court, which held: (1) Ore buying, independent milling operations, and manufacture of ferro-alloys were not admissible items of loss within the meaning of the War Minerals Relief Act; (2) claims were not assignable by operation of law, and death of claimant and dissolution of corporation relieved the Government of liability under the act.

Nine cases were abated through failure to substitute Ickes for Wilbur as Secretary of the Interior.

One case was dismissed by court for failure of plaintiff to prosecute the case.

During the fiscal year 19 decrees were certified to the Secretary of the Interior.

IN THE CONGRESS

Three bills to further amend the War Minerals Relief Act were filed in the Seventy-fourth Congress. One bill, to permit claimants who did not file petitions under the 1929 amendment to submit claims for reconsideration by the Secretary of the Interior without recourse to the courts, and to permit claims to pass by operation of law to a legal successor; and two bills, to direct reimbursement for interest paid or accrued on borrowed money from March 2, 1919, to date. These bills were not enacted within this fiscal year.

PETROLEUM ADMINISTRATIVE BOARD

(CHARLES FAHY, *Chairman*)

The Secretary of the Interior was appointed Administrator of the Petroleum Industry under the National Industrial Recovery Act by Executive order dated August 28, 1933. The Petroleum Administrative Board functions under an administrative order of the Administrator. During the life of the Code of Fair Competition for the Petroleum Industry (Aug. 19, 1933, to May 27, 1935, on which last-named date all codes approved under the National Industrial Recovery Act were invalidated by the Supreme Court of the United States) the Board assisted and advised the Administrator in the administration and enforcement of the code. The Board also assisted and advised the Secretary of the Interior in the administration and enforcement of section 9 (c) of the National Industrial Recovery Act, under which the President by Executive order of July 11, 1933, prohibited the shipment in interstate commerce of petroleum or the products thereof produced in excess of the amount permitted by State law. By Executive order of July 14, 1933, the President had delegated the administration and enforcement of this provision to the Secretary of the Interior. Said section 9 (c) was invalidated by the Supreme Court of the United States on January 7, 1935. On February 22, 1935, Congress reenacted the principles of section 9 (c) by prohibiting shipments in interstate or foreign commerce of petroleum produced in excess of the amount permitted by State law, and the products of such petroleum. Under authority granted by the act the President again by Executive order, dated February 28, 1935, delegated to the Secretary of the Interior the administration of this act with the exception of its provision permitting the suspension under certain conditions of the prohibition of shipments. The Board has assisted the Secretary in his duties under this act.

After the invalidation of the codes Congress on June 14, 1935, amended and extended the National Industrial Recovery Act, which now expires April 1, 1936. By Executive order of June 15, 1935, the President extended existing agencies under the act, including the Administrator for the Petroleum Industry; and the Board in addition to its functions under the Connally Act is engaged in advising and assisting the Administrator in those functions authorized by the amended act which relate to the petroleum industry.

At the end of the fiscal year the Board consisted of Charles Fahy chairman; Norman L. Meyers, E. B. Swanson, and John W. Frey members. Mr. Nathan R. Margold had retired as chairman November 22, 1934, to devote his full time to the duties of Solicitor of the Interior Department, and Mr. J. Howard Marshall had resigned as a member of the Board on June 21, 1935.

The labor provisions of the code were administered under the Administrator by the Petroleum Labor Policy Board with such assistance on the part of the Petroleum Administrative Board as the Administrator and the Labor Board desired.

In October 1934 a Federal Tender Board was created in east Texas to aid in the administration of section 9 (c) of the National Industrial Recovery Act, composed of Norman L. Meyers (chairman), J. Howard Marshall, and Ralph Horween, members. Mr. McCorquodale was the attorney for the Tender Board in east Texas. This Board ceased operations when the section was invalidated January 7, 1935. Under the terms of the act of February 22, 1935, above referred to, Federal Tender Board No. 1 was created in east Texas on March 1, 1935, to administer the act in that area. This Board was composed of Norman L. Meyers (chairman), M. S. McCorquodale, and John F. Davis, members. Mr. McCorquodale resigned at the close of the fiscal year. Under the same act Federal Petroleum Agency No. 1, with Mr. George W. Van Fleet as Director, was established on April 25, 1935, to perform the investigational work incident to the operations of Federal Tender Board No. 1.

The Petroleum Administrative Board, the Petroleum Labor Policy Board, the original Tender Board, Federal Tender Board No. 1, and Federal Petroleum Agency No. 1 expended during the fiscal year approximately \$560,000 out of a total of \$739,345 available for expenditure.

With the invalidation of the code as a result of the Supreme Court decision of May 27, 1935, the activities of the Petroleum Administrative Board and of the Petroleum Labor Policy Board under the National Industrial Recovery Act, though not of the Petroleum Administrative Board under the Connally Act, have been restricted to a series of studies and to research work hereinafter referred to.

The Code of Fair Competition for the Petroleum Industry was in effect during the entire fiscal year except the last 33 days thereof. Under the code, in conjunction with the success achieved beginning in October 1934 by the Federal Tender Board in sharply restricting movements in interstate commerce of illegal crude and gasoline, and particularly under the successful operations of the production and refinery provisions of the code, the petroleum industry as a whole achieved a balance between the production of crude oil and the manu-

manufacture of gasoline on the one hand and the requirements of the Nation for crude oil and gasoline on the other. This was the purpose of the production and refining provisions of the code. The theory of these provisions of the code, particularly the production provisions, and the amendments to the refinery provisions of April 24, 1934, was the balancing of supply with demand in the interest of conservation and of stability within the industry. As a necessary concomitant were the provisions of the code designed to regulate the development of new fields through the approval of plans designed to permit greatest ultimate recovery and economical and scientific development.

Under the production provisions of the code the estimates of required production were prepared currently by the Bureau of Mines and the Petroleum Administrative Board upon the basis of statistical data received and tabulated by the Bureau of Mines and were recommended to the Petroleum Administrator by the Petroleum Administrative Board. They were certified by the Petroleum Administrator to the regulatory commissions of States having such agencies, to industrial proration committees in States without regulatory commissions, and to the Governors of oil producing States which were without either regulatory commissions or industrial proration committees. The method employed in making the estimates was based primarily upon calculation of gasoline production necessary to meet the demand therefor, with additions to or subtractions from storage, and the quantity of crude oil necessary to manufacture the required gasoline, together with such crude oil as was required for export and use directly in the field for fuel purposes. Allowances also were made for crude-oil imports and withdrawals from or additions to crude oil storage.

During the fiscal year the production of crude petroleum in the United States exceeded by slightly less than 4 percent the amount determined by the Federal agency to be sufficient to provide for consumer demand for petroleum products after due account had been taken for probable withdrawals from storage and of anticipated imports. Production in excess of the allowables was less during the latter portion of the fiscal year than in the earlier months, as shown by the table accompanying the complete report of which this is a summary.

The balancing of crude-oil production with consumer demand for petroleum products as provided for in the code did not necessitate the restriction of output during the past fiscal year below that of the preceding year. One of the objectives of the industry in connection with crude-oil production has been to establish as nearly a uniform rate of production throughout the year as possible, as

such uniformity leads to efficiency in operation, stability of employment, and assists the State regulatory commissions and others in the control of production from the various wells and fields within a State. During the calendar year 1933 crude-oil production varied from 2,102,000 barrels in January to 2,813,000 in June, or a range of 711,000 barrels between the lowest and highest daily rates of production. During the calendar year 1934 crude-oil production ranged from a low of 2,323,000 barrels in January to a high of 2,655,000 barrels in June, or a difference of 332,000 barrels between the lowest and highest daily rates of production. This range was identical with that recorded during the 1935 fiscal year when crude-oil production ranged from a low of 2,413,000 barrels daily in November and December 1934 to a high of 2,745,000 barrels daily during June 1935. This comparison indicates a definite tendency toward the attainment of the industry's objective of as nearly a uniform monthly rate of production as possible.

During the period of operations under the Petroleum Code, the smaller oil producing States produced a larger share of the national crude-oil output than they did immediately prior to the period of the Petroleum Code. This change did not result through transfer by the Federal agency (Department of the Interior) of production allowables from one State to another, but undoubtedly came about through the coordination of Federal and State activity whereby there was eliminated the localized excess production which characterized the petroleum industry immediately prior to the period of the code.

According to section 1, article III, of the Petroleum Code, imports of crude petroleum and petroleum products for domestic consumption were to be limited to volumes bearing such ratio to the estimated volume of domestic production as would effectuate the purposes of the Petroleum Code and the National Industrial Recovery Act. In the Administrator's order of September 2, 1933, such imports were directed to be limited to an amount not exceeding the average daily imports of petroleum and petroleum products during the last 6 months of 1932. During that semester total imports of crude and refined products averaged 108,000 barrels daily, of which 10,000 barrels daily were bonded imports and 98,000 barrels were imports for domestic consumption. During the 1935 fiscal year total receipts of crude petroleum and refined products from foreign countries aggregated 52,354,000 barrels, or a daily average of 143,435 barrels. Receipts for domestic consumption totaled 34,578,000 barrels, a daily average of 94,734 barrels, or somewhat under the daily average of 98,000 barrels of imports for domestic consumption during the last 6 months of 1932. Imports in bond, consisted of

supplies for vessels and oil imported for refining and export, amounted to 17,776,000 barrels, or a daily average of 48,701 barrels.

Experience under the Petroleum Code demonstrated that the balancing of crude oil supply with the consumer demand for petroleum products necessitated the control of withdrawals of crude oil from storage as well as the regulation of current production and imports.

The general objective of the administration was to permit at all times such withdrawals of crude oil from storage as were necessary to prevent discrimination against refining plants which did not have an ample supply from sources of current production; to permit, during periods of high seasonal demand, such withdrawals as were consistent with the reduction of inventories toward economic levels without unreasonable limitation of current production; and, during periods of low seasonal demand, to avoid net withdrawals so that the crude oil required for refining and exporting would be supplied from current production. It was felt that such procedure aided the State authorities and industry committees in the enforcement of production orders, contributed to the prevention of physical waste by lowering the amount of oil held above ground in storage, and avoided discrimination between operators.

In line with this procedure, crude-oil inventories were reduced during the period of high seasonal demand from 357,239,000 barrels on June 30, 1934, to 337,085,000 barrels on December 31, 1934. The continuation of a high rate of demand during December 1934 and the demonstrated necessity to increase gasoline inventories brought about such a high level of refining operations, with concurrent large withdrawals from crude-oil storage, that production allowables were raised during the month to conform with the increased demand for crude oil.

Beginning with a revised inventory figure of 337,254,000 barrels on January 1, 1935, the amount of crude oil in storage was not reduced further during the period of low seasonal demand, but increased to 338,559,000 on May 31, 1935. During June 1935, with the beginning of the period of high seasonal demand and with the code invalidated, crude-oil inventories were reduced 3,802,000 barrels, to a level of 334,757,000 barrels on June 30, 1935.

The provision in the Petroleum Code whereby no petroleum produced from a newly discovered source of crude petroleum could be shipped in or affecting interstate commerce unless a plan for the development of the new pool had been approved by the Administrator is regarded quite generally as a particular accomplishment under the Petroleum Code leading to the conservation of petroleum resources and the prevention of waste. Regulations designed to provide for the submission of plans for the systematic and orderly development of new pools were approved by the Administrator on December 23,

1933. Each new plan as submitted by operators in the new pool was reviewed by the technical staff of the Petroleum Administrative Board and the United States Geological Survey before submission to the Administrator. Where divided views existed concerning the provisions contained in the plan as submitted, hearings either in Washington or in the field were held concerning the merits of respective development programs.

During the fiscal year ended June 30, 1935, the Petroleum Administrator approved 122 plans for the orderly development of new oil pools.

The refining article of the Petroleum Code provided for a joint governmental and industrial organization in which the Federal agency determined the total production of gasoline necessary to meet the current demand therefor and the proper total inventories of gasoline, and the planning and coordination committee divided the national total of production and inventory changes into district totals, and district allocators or allocating agencies divided the totals among plants within the district. Provision also was made for the hearing of appeals from plant and district allocations, with the result that the original determinations were in several instances amended as the needs for additional gasoline production became evident. Gasoline production in the United States exceeded the total determined as necessary by but approximately 1 percent, as shown by table accompanying the full report.

During the fiscal year ended June 30, 1935, the accounting division was engaged with various and sundry investigations ordered by the Administrator or requested by members of the Board, all of which had a direct bearing upon code enforcement. A résumé of its activities is as follows:

Preliminary figures on the study of the economic cost of recovery of crude petroleum ordered by the Administrator on December 20, 1933, were released September 19, 1934. The survey covered 3 calendar years, 1931, 1932, and 1933. One thousand and nine schedules covering cost data on 1,133 companies were included in the tabulations. A substantial percentage of the total production—75.72 for 1931, 76.71 for 1932, and 72.22 for 1933—uniformly spread over the various producing areas was covered.

The average per-barrel cost for the country as a whole, including interest on invested capital, was found to have been as follows: 1931, \$0.894; 1932, \$0.808; and 1933, \$0.717. In order that the effect of the code upon costs might be ascertained, the year 1933 was segregated into two periods. The first was from January 1 to September 30, which included but 1 month (September) of code enforcement, and the second from October 1 to December 31, during which time the code was in full effect. For the former period costs

for the country as a whole declined to the lowest on record to \$0.669 per barrel, rising during the latter period to \$0.772 per barrel. Costs were also shown by States and for the more important pools and fields within the States. In addition to the financial and investment data, information was gathered also on wells, proven acreage, and potential reserves.

A continuation of this study to cover the year 1934 was ordered by the Administrator on December 14, 1934. At the close of the fiscal year considerable progress had been made in completing that study. In all 891 schedules covering the operation of 1,021 companies and 55.5 percent of the 1934 production had reported. These schedules have been carefully analyzed, audited, and tabulated. The issuance of the results of this study await the outcome of a recent request made upon the larger companies, furnishing information for the previous study who by reason of the invalidation of the code have not reported, to submit their schedules for the 1934 period.

Through the summer and fall of 1934 there was a gradual increase in the amount of overproduction of crude oil, particularly in east Texas, where the State enforcement proved unequal to the task of obtaining compliance with State allocations which were within the Federal allocations. The pressure of this overproduction on the market very nearly brought on the collapse of the price structure of crude and of the efforts to balance supply with demand.

The decision of the Circuit Court of Appeals for the Fifth District in the *Panama* and *Amazon* cases reversing the lower court and upholding the power of the Federal Government to require reports in the enforcement of section 9 (c) of the National Industrial Recovery Act, and upholding the validity of the section itself, permitted the reestablishment of Federal enforcement in east Texas. In July 1934 and again in August regulations requiring reports and affidavits were revised. However, by filing fraudulent affidavits of the legality of oil shipped and by failing to make reports, hot-oil producers continued to operate in violation of the law and a new means of enforcement of the section was sought resulting in October of 1934 in the creation of the Federal Tender Board under the authority of section 9 (c) and the authority to make rules and regulations to carry out the provisions of the section. In lieu of the affidavits of legality required with shipments, certificates of clearance, issued by the Federal Tender Board, were required as a condition precedent to the movement of petroleum and petroleum products in interstate commerce out of east Texas. Conditions had become so serious that prices had begun to break the day the Tender Board was created. The immediately successful operations of this Board stemmed the flow of hot oil into interstate commerce and averted a collapse.

The Federal Tender Board set up a staff of examiners to check applications for tenders, to examine the books and records of refiners and pipe lines, and to make physical checks of the petroleum and petroleum products leaving the field. It set up an accounting staff which maintained an effective accounting check on all operations in the field. Certificates of clearance, or tenders, were approved by the Federal Tender Board when the petroleum or petroleum products were shown on the basis of the applicant's reports, the accounting record, and the specific examination of examiners to have been produced in accordance with the quotas established by the Railroad Commission of Texas.

The Federal Tender Board functioned effectively until January 7, 1935, when the Supreme Court overruled the Circuit Court of Appeals in the *Panama* and *Amazon* cases and declared section 9 (c) invalid on the grounds of improper delegation of legislative power. The Board ceased functioning, and the litigation pending against it was dismissed. Movements of hot oil increased immediately. Additional State legislation authorizing the State to require certificates of clearance for petroleum products as well as for crude petroleum moving in intrastate and interstate commerce, had been passed. However, State authority law alone still failed adequately to meet the situation and commerce in hot oil steadily increased. On February 22, 1935, the Connally law was passed by the Congress, eliminating the defects found by the Court in section 9 (c) by specifically prohibiting interstate or foreign commerce in hot oil. Federal Tender Board No. 1 was established under this law on March 1, 1935, and shortly thereafter Federal Petroleum Agency No. 1 was set up under the same law to perform the administrative and investigative functions in connection with the applications for approved tenders filed with Federal Tender Board No. 1. The Federal tender system has functioned effectively since that time and has prevented any substantial movement in interstate commerce of hot oil or gasoline out of east Texas. This activity not only tended to check overproduction of crude petroleum but assisted in stabilizing the interstate refinery markets at a time when the intrastate Texas markets were thoroughly demoralized. Several attempts to enjoin the activities of the Board have been attempted without success.

During the summer and fall of 1934 wholesale prices for petroleum products were below parity with the current prices for crude petroleum, which presented a particularly serious problem to the non-integrated refiner. Several plans were projected by the industry to solve the difficulty, which was aggravated considerably by the excessive amount of hot oil and interstate movements of hot gasoline in interstate commerce. The planning and coordination committee pro-

posed a form of contract designed to remove distress stocks in east Texas from the market. The form of contract was approved on June 23, 1934, and during the months of July and August gasoline in east Texas was purchased under this form of contract, to which the Administrator was a party and which provided that the sellers would not process "hot oil." This program proved insufficient, and a new form of contract for the purchase of current output was approved. But the production of gasoline from "hot oil" continued, stocks of gasoline mounted, wholesale prices for gasoline remained below parity with crude-oil prices, and in the early fall of 1934 the industry approached a serious collapse of the wholesale market. The planning and coordination committee appointed a program committee, which proposed a broad plan for the purchase of surplus gasoline with the purpose of also preventing illegal production of crude oil and providing a method of orderly marketing. The excessive amount of overproduction in Texas made the initiation of this program futile, and it was never put into operation. In October the Federal Tender Board was created in east Texas to enforce section 9 (c). Conditions immediately improved as a result, and from then forward the improvement continued, except for the period between the invalidation of section 9 (c) on January 7, 1935, and the enactment into new legislation of the principle of the Tender Board in the Connally Act on February 22, 1935. The operations of the Tender Board, of the production provisions of the code and refinery amendment, and of the stabilization committee of the planning and coordination committee with the cooperation of the Petroleum Administrative Board, brought the desired parity between the wholesale price of gasoline and crude oil in the spring of 1935. The work of the stabilization committee contributed very largely to the elimination of excessive marketing abuses which tended to keep the retail markets in an unsettled and unstable condition.

One of the difficult marketing problems of the year revolved around the question of price differentials as between different types of marketers. The stabilization committee, authorized by the Administrator in July 1934, was successful in resolving many localized conflicts and in compromising issues which had brought on drastic price wars to the injury of many marketers caught in between the warring factions. Before the end of the winter markets generally throughout the midcontinent and eastern areas were fairly stable, and at the time of the invalidation of the code at the beginning of the high-consuming season, the industry as a whole had reached stability in markets, an even balance between production and demand in the case of both crude and gasoline, had achieved the best statistical position in many years, and entered upon a prosperous summer

which has, in fact, proved to be the highest-consuming season in the history of the oil industry. Production was under control throughout the Nation with some minor exceptions, the wholesale price of gasoline was in parity with the current price of crude, the refinery amendment had brought a balance between the manufacture of gasoline and the needs of the Nation therefor, the Connally Act had succeeded, as the original Tender Board had previously succeeded in protecting interstate commerce from "hot oil" or gasoline, and markets were generally stable.

One of the important marketing decisions made by the Administrator under the code was that of March 4, 1935, under rule 19 of article V, known as the "lease and agency decision." The Administrator in this decision permitted the cancelation of all lease and agency agreements on 30 days' notice and prohibited exclusive conditions in the sale of lubricating oil. The question of whether or not exclusive dealing contracts violated the antitrust laws was referred to the Federal Trade Commission for determination.

To obtain compliance with the Petroleum Code and to guarantee the independent refiner a crude supply and market for his products and to prevent the dumping of gasoline and price cutting on the Pacific coast, the Pacific coast petroleum agency and refiners' agreements were executed and approved by the Administrator on June 23, 1934, and subsequently were filed with the Federal court under a consent decree in California with the consent of the Department of Justice. The agency agreement, to which all major companies and their subsidiaries and two smaller companies were parties, provided for a guaranteed supply of crude to independent refiners, parties to the refiners' agreement, and a market for such products as the refiners were unable to sell in the retail market. The refiners agreed to limit runs to stills to a definite proportion of the business of the area as determined by their past sales records. However, no limitation was placed upon sales. All refiners agreed to resale price maintenance to prevent price cutting by subsidiary or dealer accounts. There was no agreement as to prices, each refiner setting any price he desired. Every refiner agreed not to handle oil produced in excess of the allowables established under the Petroleum Code. In addition there were several provisions relating to marketing practices established at the request of independent refiners and provisions for general compliance with the terms of the Petroleum Code. The Administrator reserved the right to cancel the agreement at any time and appointed a representative on the board of governors of the agency established under the agency agreement to make definitive interpretations, to check the administration of the agreements, and to report to the Administrator on any monopolistic trends or inequities in the operation of the agreements.

As a direct result of these agreements one of the most disastrous and protracted price wars ever to occur on the Pacific coast was brought to an end. Furthermore, a simple and administratively effective device for securing compliance to production quotas was obtained; since signatory refiners were obligated not to deal with producers who violated the Petroleum Code, producers were compelled to comply with the code in order to find a market.

Illegal overproduction of crude oil was reduced to less than 2 percent, and even this amount was eliminated by temporary injunctions in effect at the time of the invalidation of the codes. Gasoline markets were stabilized and there were no serious price disturbances during the period of the agreement, with the exception of a price war in Arizona.

The benefits of these agreements were immediate. The independent refiners obtained a fair volume of business at a fair price either through direct outlets to consumers or to the agency created by the agency agreement. By the elimination of price wars the retail dealers obtained a fair margin and a fair volume. A group of dealers possessing a very large storage capacity lost gallonage; they were accustomed to fill up their storage during low-price periods and then to dump gasoline on the market during periods of comparative price stability, thereby causing price wars enabling them to refill at low prices. The average prices for the period of the agreements were lower than any 6-month period prior to the operation of the agreements.

Over the period of the operation of the agreements constant reports were made by representatives of the Administrator in California and the far Northwest on operations under these agreements and of the inequities resulting therefrom. Investigations disclosed that certain major companies were violating the letter and spirit of the agreements. The resale price maintenance prevented major companies from marketing through subsidiaries at a differential. This provision was specifically required by the Department of Justice as a condition of its consent to the modification of the consent decree. The major companies consented to the elimination of this differential but also insisted upon meeting all competition, thus eliminating the price differential of the independent refiners. Investigations of the operation of the agreements under these conditions resulted in a shifting of gallonage from the independent refiners to the major companies, necessitating the absorption through the agency of large quantities of gasoline processed by the independent refiners for which they had no other market. This resulted in an increased burden on parties to the agency agreement, bearing most heavily upon members who either suffered actual losses of gallonage or gained least in the absorption of the normal markets of the inde-

pendent refiners. Furthermore, it decreased the flow of independent distributors and retail dealers who previously provided a market outlet for the gasoline processed by the independent refiners. The Petroleum Administration furnished the oil industry in California a detailed analysis of the problem, and at the time of the cancellation of the agreements because of the Supreme Court's decision negotiations were under way for revision of the agreements to secure compliance with all provisions of the code by the major companies and to make provision against the shifts in gallonage which occurred largely as a result of the elimination of differentials. Immediately after the Schechter decision, and the consequent suspension of the Petroleum Code and the cancellation of the Pacific coast agreements, the retail markets of California collapsed and have so remained. Crude-oil production control ceased with the code. Voluntary curtailment efforts failed to balance production with demand; enforcement of the State gas-oil ratio statute likewise failed to achieve a balance; production mounted; and as this summary is concluded the price of crude oil in California has broken sharply, August 29, 1935, 5 days after the adjournment of Congress, which was until the last considering Federal regulatory legislation designed, among other things, to achieve a balance between production and demand.

The most important court decisions were the following:

On January 7, 1935, the Supreme Court held section 9 (c) of the National Industrial Recovery Act, commonly known as the "hot-oil section", invalid for the reason that it constituted an unlawful delegation of legislative power to the President. On February 22, 1935, the President approved the act of Congress known as the Connally Act, under which Congress itself prohibited the shipment in interstate and foreign commerce of hot oil or its products, framing the statute so as to meet the objections pointed out by the Supreme Court to section 9 (c). The decision of January 7, 1935, was in the cases known as the *Panama Refining Co.* and the *Amazon Petroleum Corporation* cases. Although it was hoped that these cases would also bring about a decision on the power of the Federal Government to control production as distinguished from interstate movements of illegal oil or its products, the Court found that the production-control question was not properly before it. When these cases were in the Circuit Court of Appeals for the Fifth Circuit that court held that the District Court of the United States for the Eastern District of Texas had erred in enjoining the enforcement of the production provisions of the code, that court assuming that the question was properly before it.

In the case of *United States v. Wilshire Oil Co. et al.* the District Court of the United States for the Southern District of Cali-

California upheld the Federal power to control production under the commerce clause of the Constitution; but while this case was on appeal the Supreme Court decided the *Schechter Poultry case*, holding that the code-making machinery of the National Industrial Recovery Act also constituted an unlawful delegation of legislative power to the President. As a result of this decision the Petroleum Code, along with all other codes, was invalidated.

In the case of *United States v. Eason Oil Co.* the United States District Court for the Western District of Oklahoma held that the provisions of the code relating to plans for the development of new fields were invalid as not within the power of the Federal Government under the commerce clause. It was not possible to raise either in production or new pool cases the question of the Federal power under the war powers to prevent waste due to the fact that the National Industrial Recovery Act was not based on this power.

There were a number of marketing cases pending at the time of the Schechter decision. The lower courts had divided on the question of the effect on interstate commerce of such marketing provisions as the prohibition against special inducements in connection with the sale of gasoline.

Since the invalidation of the codes by the Schechter decision, the Petroleum Administrative Board has worked on a curtailed program and with a reduced staff. It has continued its duties in connection with the administration of the Connally law and is engaged in research along the lines laid down by the President under the National Industrial Recovery Act, as amended.

The Board is making and completing a series of specific studies, including the following:

- (1) Completion of the study of the cost of production of crude petroleum.
- (2) A study of the marketing structure of the representative area of Allen County, Ind.
- (3) A study of the effect of the abandonment of the code upon production, refining, and trade practices.
- (4) A study of the benefits of the new pool section of the code and the results of the abandonment of the code on new pool plans.
- (5) Appraisal of the operations of the Pacific coast petroleum agency agreement and the effects of its abandonment.

In addition to these specific studies, the Petroleum Administrative Board is preparing a complete final report on the operations of the code which will, in fact, be a history of the petroleum industry during the 2 years in which the code was operative, supplemented by studies subsequently made.

During the year and in cooperation with other divisions and bureaus of the Department of the Interior the Board furnished considerable volume of statistical and technical data to the subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives, which made a very thorough investigation of the petroleum industry with a view to recommending legislation. This data was published in volumes I and II of the Hearings Before a Subcommittee of the Committee on Interstate and Foreign Commerce, House of Representatives, Seventy-third Congress, House Resolution 441.

BUREAU OF RECLAMATION

(ELWOOD MEAD, Commissioner)

The acute drought of 1934 in the West brought into bold relief the benefits that accrue from irrigation and especially from operation of the Federal reclamation policy. In a year when all through the arid region farmers and ranchers who were dependent upon the natural rainfall were suffering losses aggregating hundreds of millions of dollars, Federal reclamation projects were green and flourishing. On these projects no crops were lost, no stock died. Indeed, these projects mitigated the effects of the drought in their surrounding areas, supplying feed for range stock and provisions for the cities.

There never has been a clearer illustration of the stabilizing effect of stored water on the agriculture of the West. There has been no better demonstration of what Federal reclamation contributes to the economy and welfare of the arid States. The fact that normal crops were harvested on these fields, when in large areas no other green thing was left, enabled western communities in many instances to avoid what otherwise would have been complete disaster. Irrigated crops provided traffic for railroads, saved important industries, bolstered county and State finances, and buoyed the morale of the entire section.

An experience such as the drought, however, was bound to point out ways by which Federal reclamation might be strengthened. It served to emphasize the need for closer contact between the Bureau and the water users on Federal projects in order that maximum usefulness of the land and water might be obtained. To bring this about the projects were divided into five divisions for supervision so that the problems of water users might have more immediate and intimate attention. The direction of operation and maintenance projects was centered in Washington. Preliminary reports of division superintendents have sketched a rough outline of work to be done in this regard.

Some of the problems the supervisors encountered were the need for introduction of better and more economical irrigation methods in areas where wasteful methods are practiced; control of noxious weeds; prevention of soil erosion on steep lands of some projects; and the need for planning on the part of water users' organizations to meet maintenance and repair expenditures.

Problems individual to each district were found by the supervisors. Progress is being made toward their solution. This is a major step forward and will result in permanent improvement in the relationship between the Bureau and the water users. It will solidify the Federal program by providing a better means of presenting needs for their immediate consideration, and by improving the condition of the farmers under the canals.

Little definite information was available generally concerning the place of the Federal reclamation projects in the national economy, and concerning the condition of the projects. These subjects were in controversy, and widely differing assertions had been made. The Secretary selected John W. Haw, director of the agricultural development department of the Northern Pacific Railway Co., St. Paul, Minn., and F. E. Schmitt, editor of the Engineering News-Record, New York City, to make an independent study of typical Federal projects for the purpose of ascertaining the true conditions. After a careful investigation of many of the Bureau's projects, Mr. Haw and Mr. Schmitt made a detailed and valuable report from the summary, of which these paragraphs are quoted:

Reclamation by irrigation of lands in the arid and semiarid western half of the United States is shown by its results to be a sound and desirable national undertaking. It represents a constructive policy of social development.

Reclamation should be continued by the Federal Government as available means may permit. It has little relation to the problems of surplus agricultural production, while, on the other hand, by reason of its high degree of stability, it aids in making the country's food supply more regular, which in turn tends to reduce the fluctuations of the agricultural price level.

Except for the influence of the present depressed farming conditions throughout the United States, the operating projects are in the main excellently developed and represent strong, prosperous communities.

As a result of construction begun several years ago, about 100,000 acres of land on three projects will be available for irrigation for the first time this year. These projects are Riverton, in Wyoming, and Owyhee and Vale, in Oregon and Idaho. The proper settlement of these new areas assumes a grave importance to the communities that will be created, the States in which they are located, and the Federal Government.

Agriculture by irrigation is a skilled industry. Intelligence, resourcefulness, and technical skill are required of the successful pioneer under a canal. To protect the investment of the Federal Government in these projects the Bureau must select its settlers. Since the Bureau has no means of financing settlers and subjugation of new land requires some capital, the selection problem becomes even more important. There is no doubt that qualified settlers, anxious to relocate in more promising neighborhoods, can be found in number. The Bureau proposes to offer this national opportunity

in such a way as to attract them. This will be done through public announcements, through cooperation with the colonization agents of the railroads and Government agencies, and through State authorities. While these methods have been used in the past, a more intensive campaign seems to be indicated.

The Bureau now is engaged in the largest construction program in its history. The program makes up the greatest conservation campaign as yet undertaken by a single agency of the United States Government. Experience gained in the past places the Bureau in a good position, and although the Bureau will have to expand its technical staff it is well equipped otherwise to carry out the work.

A total of \$175,000,000 is available for the Bureau's construction work during the year. Of this \$100,000,000 was set aside by the Works Progress Administration and \$75,000,000 remained from allocations made by the Public Works Administration.

As in the past, the majority of the projects now under construction are designed to supplement the water supplies of established irrigation communities. Eleven storage dams were under construction at the close of the fiscal year on projects that will bring in no new land. They will provide a stable supply to irrigators who had felt the pinch of drought. This protection was being supplied for some of the oldest settlements in the West, notably in Utah, where the Mormons initiated irrigation by whites on the continent.

These improvements will provide a balance wheel for the stabilization of whole communities and even whole States. On the other hand, some new projects have been undertaken. These have been planned carefully so as to give a well-integrated development in areas where the demand is present. The Casper-Alcova project in Wyoming, now under construction, is a case in point. Ultimately this development will provide water for about 35,000 acres of land now unirrigated. This area is intended to assist in the stabilization of the livestock industry of that section of Wyoming, and to provide hay for the herds and produce for the urban centers.

A revealing commentary on the work of the Bureau is to be found in the fact that despite the launching of a great construction program, only a small percentage of the requests for new projects received from States and communities could be considered.

During the year Boulder Dam, the principal structure authorized in the Boulder Canyon Project Act, was completed. The last bucket of concrete was poured in the dam May 29, 1935. On that date this great Colorado River barrier already had stored enough water to supply for a year the irrigation needs of the Yuma Federal reclamation project and the Palo Verde and Imperial Valley developments in California, which lie below it.

The fine agricultural area in Imperial Valley experienced its most severe drought last year. Damages approximating \$10,000,000 resulted when the Colorado ran virtually dry. When the gates were closed at Boulder Dam in February of 1935 recurrence of this drought was made impossible, as was repetition of the floods that in the past have wrought equal havoc along the lower Colorado River.

During the spring a flood of 105,000 second-feet was recorded in the Colorado River above Boulder Dam. Had this flood passed the dam, there would have been grave danger to the Imperial Valley. The protective levees were cracked as a result of the extended drought, and the considerable cost of repairing them was saved.

Completion of Boulder Dam provided another example of the Bureau's contribution to types of conservation other than reclamation. The great reservoir, 115 miles long, was set aside immediately as a bird refuge. It is being stocked with game fish. In its first few months of existence it attracted many thousands of tourists. Hundreds found pleasure in bathing in and boating on its clear, cold waters. Boulder Dam Reservoir is destined to become one of the most important recreational centers of the Southwest, and the Bureau is making plans to develop it. Its importance in this respect exceeds that of others of the 68 reservoirs controlled by the Bureau only because of its great size and location.

The snowfall on the western watersheds during the winter was sufficient to provide an adequate water supply for all Federal projects. With most reservoirs completely filled and none critically low, the projects entered the cropping season with good prospects for a prosperous year.

CONSTRUCTION ACTIVITIES DURING FISCAL YEAR

The Bureau during the year continued construction work with funds allotted by the Public Works Administration and accomplished more than in any other year of its history. There were constructed 65.7 miles of roads, 34.4 miles of railroad, 44.5 miles of transmission lines, 313.1 miles of canals and drains, 16 tunnels with a total length of 18,645 feet, 2,671 canal structures, 69 bridges, and 474 culverts. There were excavated 29,247,403 cubic yards of earth and rock, making the total to date 356,209,687 cubic yards. The Bureau used 1,524,302 barrels of cement and placed 1,740,673 cubic yards of concrete. Work on five storage dams was begun. In the Denver office the increased activities gave employment to 700, and design and specification work for the Tennessee Valley Authority was continued.

At Boulder Dam the labor contracts with Six Companies Inc., and Babcock & Wilcox were in progress. Storage in the reservoir com-

menced in February, and in June of this year the last yard of concrete was placed in the dam. The power house was practically completed, and installation of electrical machinery and equipment was started.

On the Columbia Basin project, Washington, the Mason-Walsh-Atkinson-Kier organization, contractors for the Grand Coulee Dam, installed a belt-conveyor system to move excavated materials from the dam site, constructed a steel sheet-piling cofferdam on the west side of the river, and at the end of the year had excavated 8,120,000 cubic yards in the dam abutments. The town of Mason City, to house their 3,000 workmen, was completed. A connecting branch railroad from the dam site to Odair on the Northern Pacific was finished and placed in operation. The Secretary on June 5 approved a change order which calls for construction of a 177-foot dam with a foundation which will support the ultimate high dam, in place of the low dam originally planned. J. H. Pomeroy & Co., Inc., San Francisco, Calif., on November 5 was awarded a contract for furnishing materials and erecting the Columbia River highway bridge for \$241,868. Other construction work in progress included construction of school building, residences, administration building, and dormitories in the Government camp site, officially designated Coulee Dam.

Additional contracts for earthwork on the all-American canal were awarded on May 22 to Lewis Chambers Co., New Orleans, La., for 16.6 miles of canal excavation at their bid of \$505,506.10, and to Mittry Bros. Construction Co., Los Angeles, Calif., for 6.6 miles at a bid of \$260,400. Near Calexico, Calif., 1,487,000 cubic yards of canal excavation were accomplished by force-account methods. Bids were opened on August 23 for construction of the Parker Dam and appurtenant works, a 340-foot concrete arch structure in the Colorado River 12 miles above Parker, Ariz., which will be the diversion dam for the aqueduct of the metropolitan water district. The low bid of \$4,239,834 was submitted by Six Companies, Inc., San Francisco, Calif., to whom contract was awarded on September 10. The Bureau is constructing this dam for the district.

Work was in progress on the Agency Valley Dam and storage reservoir on the Vale project, Oregon, and the contract was 66 percent completed at the end of the year. On August 31 a contract for building 27 miles of the Vale Main Canal was awarded to Haas, Doughty & Jones, Marshall & Stacy, of San Francisco, Calif., for \$65,204.20. On the Owyhee project the construction work included the North and South main canals, laterals, canal structures, and siphons. On December 27 the Consolidated Steel Corporation, Ltd., Los Angeles, Calif., at its bid of \$536,057, was awarded a contract for furnishing

and erecting 80-inch diameter plate-steel pipes for the Malheur River siphon, 4.2 miles in length, and 70-inch diameter pipe for the Dead Ox siphon, 1,700 feet in length. Parker-Schram Co., Portland, Oreg., with a bid of \$64,764.50, obtained a contract for the Malheur River siphon inlet and outlet structures. J. A. Terteling & Sons, Boise, Idaho, on December 21 was given the contract for 27 miles of earthwork and structures on the North Canal at their bid of \$123,894. A contract for 14 miles of the South Canal was awarded on January 21 to Morrison-Knudsen Co., Boise, Idaho, for \$232,991.50. This contractor on April 12 obtained a second contract for building structures on the South Canal, the price being \$92,388; and on May 21 was awarded a third contract for an additional 11.5 miles of South Canal earthwork and structures, their bid being \$127,485. Several small contracts for laterals and lateral structures were given to local contractors.

Work on the Ogden River project near Ogden, Utah, was started, and on September 12 the Utah Construction Co. and Morrison-Knudsen Co., with a low bid of \$677,898.10, were awarded a contract to build the Pine View Dam in the Ogden River near Huntsville. Relocation of the Huntsville highway around the reservoir was necessary, and the same companies were given the contract on October 6 for \$100,196.35. On April 18 the Union Construction Co. of Ogden was the successful bidder for constructing the Ogden-Brigham tunnel on the Ogden-Brigham Canal and was awarded a contract for \$77,737.50 on May 25. The Barnard-Curtiss Co., Minneapolis, Minn., on May 25 was given a contract for building the Ogden Canyon conduit, comprising 4.7 miles of 75-inch diameter wood-stave pipe.

Another Utah project, on which construction was commenced, was the Moon Lake project near Duchesne, for which a P. W. A. allotment of \$1,200,000 was available. Bids were opened on February 4 for building the Moon Lake storage dam. T. E. Connolly, San Francisco, Calif., was the successful bidder, and on April 2 was awarded the contract for \$547,221. The Hyrum storage dam in Little Bear River, on the Hyrum project, was 96 percent completed at the end of the year. On October 31, J. A. Terteling & Sons, Boise, Idaho, was awarded a contract for \$27,316 to build the Hyrum-Mendon, Hyrum Feeder, and Wellsville Canals.

A \$2,000,000 allotment was available for the Humboldt project near Lovelock, Nev., and a contract for construction of the Rye Patch Dam in the Humboldt River was awarded on November 28 to J. A. Terteling & Sons, Boise, Idaho, at their bid of \$256,322.50. Construction of the Taylor Park Dam and storage reservoir on Taylor River on the Uncompahgre project in Colorado was started. Bids were opened on February 18, the low bid of \$798,078.50 being submitted by

the Utah Construction Co., Ogden, Utah; W. A. Bechtel Co., and Henry J. Kaiser Co., San Francisco, Calif., and Morrison-Knudsen Co., Salt Lake City, Utah. Contract was awarded on April 19. On the project distribution system repairs to canals and structures were in progress.

The diversion and outlet tunnel at the Alcova damsite on the Casper-Alcova project, Wyoming, was completed in October, Lawlor-Woodward Co., of Seattle, Wash., having the contract for \$269,905. Work on the first 3.6-mile section of the Casper Canal was in progress during the year. J. A. Terteling & Sons, Boise, Idaho, completed schedule 2 in January. The Utah Construction Co., Ogden, Utah, had schedule 1 approximately 89 percent completed at the end of the year, and schedule 3, being constructed by Edward Peterson, Omaha, Nebr., was 83 percent completed. The value of these three contracts is \$609,310. Preliminary work prior to advertising for bids on the Seminoe and Alcova Dams was in progress.

Other work in progress during the year comprised the construction of canals and drains on the Sun River project, Montana; drains and laterals on the Rio Grande project, New Mexico; drains and drain structures on the Yuma project, Arizona; Milk River project, Montana; Boise project, Idaho; and Shoshone project, Wyoming; canals and structures on the Bitter Root project, Montana; and Stanfield project, Oregon; and drains and dike construction on the Klamath project, Oregon-California. At the end of the fiscal year work was in progress on 18 projects in 12 States, and 9 dams were under construction.

STATISTICAL DATA

The area irrigated in 1934 with water from Government works was 2,837,205 acres, an increase of 8,418 acres over that for 1933.

The area cropped was 2,756,698 acres, a decrease of 41,117 acres.

The total value of crops was \$100,943,714, an increase of \$16,751,981 compared with 1933, and of \$50,751,981 compared with 1932. This increase in crop values was due largely to increased prices received for crops.

During the period 1906, when water was first available, to and including 1934, the cumulative value of crops grown on land irrigated from Government works amounted to \$2,071,183,715.

Construction payments in cash and credits from power and other sources received during the fiscal year 1935 were \$674,572.09, an increase of \$193,379.83 compared with the previous year.

Payments for operation and maintenance were \$1,078,896.04, a decrease from the previous year of \$43,577.95.

Total payments amounted to \$1,753,468.13 compared with \$1,603,666.25 in 1934, an increase of \$149,801.88. Income to the reclamation fund from all sources during the fiscal year was \$4,516,011.35, or \$91,148.66 more than for the previous year.

The operation and maintenance expense for the year was \$1,132,047.66, an increase over the previous year of \$23,097.59.

Excess of operation and maintenance cost over receipts for the year amounted to \$53,151.62, compared with an excess of receipts over expense of \$13,523.92 for the previous year.

Construction work was carried on with funds provided under the National Industrial Recovery Act. Operation and maintenance of the irrigation, drainage, and power systems was carried on with direct appropriations from the reclamation fund, money advanced by the water users' organizations, and revenues from power operations.

The act of March 27, 1934, extended the provisions of previous acts granting temporary relief to water users on irrigation projects and construction charges coming due for the year 1934 were not required to be paid. This explains the reason for the small payments as given under this heading.

SETTLEMENT ACTIVITIES

On the lower Yellowstone project, in Montana and North Dakota, a tract of 500 acres of public land was opened to entry on June 17. The customary 90-day prior right of entry was granted to ex-service men. There was a steady demand for irrigated land on the several projects. On the Riverton project, Wyoming, a total of 230 farms were actually occupied this spring. Water was available for 32,000 acres, of which 19,200 acres were irrigated. From January 1 to July 1, 1935, 59 homestead entries were made, 37 farm applications were received, 2,076 irrigable acres were taken up, and 12 privately owned farms, with a total area of 1,129 acres, were purchased by new settlers.

On the Shoshone project, Wyoming, there was a decided increase in settlement activities owing to the drought in the Middle West. Forty-eight homestead entries were made on the Willwood division, involving an irrigable area of more than 3,000 acres, and at the end of the fiscal year there were only 14 farm units available for homestead entry.

CONTRACTS

During the past fiscal year the Bureau entered into a total of 3,673 contracts, their nature and the amounts involved being summarized as follows:

Nature of contract	Number of contracts	Amount involved
Cooperative investigations.....	3	29,945.00
Supplies.....	1,065	748,610.98
Material.....	487	3,555,736.90
Equipment.....	242	2,904,766.31
Miscellaneous services.....	222	93,012.96
Construction work.....	82	45,780,354.07
Land purchases, including improvements.....	423	1,100,002.77
Land sales, including improvements.....	2	1,010.00
Leases to the United States.....	57	73,371.28
Leases from the United States.....	268	68,136.14
Compromise of damages.....	3	682.27
Rental of Government equipment.....	8	892.50
Rental of water.....	258	53,743.91
Sale of surplus electrical energy.....	49	1,081,060.51
Sale of water rights to towns.....		
Sale of water rights under the Warren Act.....	6	67,057.00
Sale of water rights within projects.....	3	21,259.14
Adjustment and relief.....	317	1,663,861.93
Transfer of project operations.....		
Miscellaneous.....	176	72,218.44
Repayment contracts.....	2	1,915,000.00
	3,673	² 58,230,722.11

¹ Contract with the Utah Power & Light Co. for the construction of 75-inch wood-stave pipe and repayment to the United States of 125/280 of the cost therefor (\$690,000). Contract with Ogden City for construction of artesian wells water works at a cost of \$225,000 and repayment to the United States of \$350,000.

² Estimated in part.

SALT RIVER PROJECT, ARIZONA

Agricultural results showed better returns than last year, improving the economic situation materially. Gross crop values on the project increased from \$9,660,000 in 1932 to \$16,500,000 in 1934, and bank deposits from \$18,212,000 to \$36,091,350. There has been a small increase in building activity locally, almost entirely, however, being confined to projects under P. W. A. or other Federal relief agencies.

The water-supply situation was temporarily relieved by spring rains in 1935. Storage, which had been depleted to 100,000 acre-feet in November 1934, was brought up to 800,000 acre-feet in May 1935. Lands with inferior water rights (about two-thirds of the project) which in some dry years have had their allotment cut to 2½ acre-feet per acre, could get 4 acre-feet. Outlook for next season is fair, 740,000 acre-feet being in storage June 30. A change has been made in the project irrigation and fiscal year to correspond with the calendar year which is expected to effect a saving in water as the old

year ending September 30, resulted in a high-peak use in that month to get water paid for but not theretofore used. Redesign of spillways at Roosevelt, Horse Mesa, Mormon Flat, and Stewart Mountain Dams, of the diversion dam at the intake of the Roosevelt power canal and of a dam on the Verde River at the Bartlett site was in progress by the Denver office of the Reclamation Bureau and the construction, estimated at \$6,800,000 will be done by the Bureau. The Indian Office is to have an \$800,000 interest in the Bartlett Dam for the development of a water supply for 610 Indian allottees. This project is expected to make available a large percentage of Verde River flood water now wasted and greatly needed for project lands.

YUMA PROJECT, ARIZONA-CALIFORNIA

Crop values on the Yuma project during 1934 were nearly double those for 1933. On the Auxiliary project the returns also showed improvement. The total value of crops, amounting to \$2,500,000, as compared with \$1,335,000 for the previous year, showed a similar trend in improvement in economic conditions, responsible factors for which were better prices in general for farm commodities, favorable weather conditions, an ample water supply, and low operation and maintenance costs. An increase in bank deposits from \$390,000 to \$618,000 during 1934 also reflects a change for the better in local economic conditions. The rise in crop values was effected by the severe drought which prevailed during the summer of 1934 over the greater part of the arid West and the Mississippi Valley. The Yuma County Farm Bureau Marketing Association handled alfalfa hay and seed, and made individual loans to its constituent members for financing growing operations. The Yuma County Water Users' Association has complied with the terms of its contract of February 5, 1931, relative to advance payment of operation and maintenance charges, and at the close of June 30, 1935, its payments were about \$30,000 in excess of the amount then due.

The excavation of 9½ miles of drainage canals in the valley division was finished in June and completes the division's drainage system to the extent of present requirements. Low flow in the Colorado River made extensive repair work unnecessary, either at Laguna Dam or on the levee system in California and Arizona.

BOULDER CANYON PROJECT, ARIZONA-NEVADA

Construction continued in progress for practically all the major features of the project, and on June 30, 1935, many of these were nearing completion. The forces of the Bureau of Reclamation and contractors were reduced gradually from 5,218 employees to 3,334 at the end of the current fiscal year.

Six Companies, Inc., contractor for construction of the dam, power plant, and appurtenant works, made steady progress toward completion of its contract. Practically all concrete was placed for the dam and superstructure, except in the galleries. The first block (K-3) reached crest elevation, 726 feet above bedrock, on February 6, all blocks on March 23, and the slot May 29. Concrete placed amounted to 3,249,773 cubic yards, of which 3,000,000 had been poured on December 5, 1934, only 18 months after the first bucket was dumped in the structure. Cooling was finished on May 20, 21 months after it was started, and grouting of contraction joints was completed on June 7, 13 months after this work was initiated. Drilling of grout holes grouting abutments progressed from the base upward to approximately 60 feet from the crest and drilling of alternate drainage holes to 280 feet from the crest.

With the exception of a small amount of miscellaneous work, both spillways were completed, the gates installed, and the bridge built across the Arizona Channel.

All concrete was placed for the intake towers up to the roof shingles, the four bridges were erected, all gates installed, and trash racks placed. Work was in progress at the end of the year for the installation of hoists and stems.

Lining was finished for all the tunnels of the penstock and outlet systems and their related shafts, passageways, and adits. The canyon wall valve houses were raised to the lower roof slab, excavations were completed for the downstream plugs in inner diversion tunnels, and the upstream plugs were poured, cooled, and grouted.

Remote-control equipment was installed for the 50-by-50-foot steel bulkhead gate at the inlet of no. 1 diversion tunnel, and the upstream section of the plug in this tunnel was poured, in which were installed four sets of 6-by-7½-foot slide gates.

The 50-by-50 foot steel bulkhead was lowered at the inlet of no. 4 diversion tunnel on February 1, turning the entire flow of the river through tunnel no. 1, under control of the slide gates, and commencing storage in the reservoir. At the end of the fiscal year the reservoir was approximately 78 miles long, contained 3,875,000 acre-feet of water, covered an area of approximately 37,700 acres, and its water surface elevation was at 910.0, 15 feet above the lower gate sills of the intake towers. The flow at Bright Angel gaging station (Grand Canyon) was 50,300 cubic feet per second on June 30, and the outflow through the plug gates 14,900 cubic feet per second.

Construction of the powerhouse building drew gradually toward its close. The walls had been raised nearly to their full heights and most of the structural steel for the roof had been placed. The

control circuit tunnel was lined, the cut and cover conduit was poured, and excavation commenced for the switchyard.

Installation of power plant machinery by Government forces was started in February 1935, and the draft tube liners for the first four of the 115,000 horsepower units were installed ready for the turbines.

The Babcock & Wilcox Co. continued its efficient fabrication of steel penstock and outlet pipe and at the end of the year had produced 30,957.7 tons of pipe sections. Erection of 30-foot penstock header sections was started in the upper Nevada tunnel on July 10, and of 13-foot diameter penstocks in the upper Nevada penstocks on September 5. At the end of the fiscal year, erection of pipe was approximately 69 percent completed for the upper Nevada system, 17 percent for the lower Nevada, 40 percent for the upper Arizona, and 15 percent for the lower Arizona.

Visitors to the project increased from 191,788 for the previous fiscal year to 328,429 for the period of this report. A monthly peak of 39,884 occurred in February and a week-end record of 9,296 on November 9 and 10.

The Bureau of Power and Light of the city of Los Angeles had erected all towers for its two 287,500 and 275,000 volt lines from the switchyard to Cajon Pass near San Bernardino, and was engaged in stringing the 1.4 inch diameter hollow copper conductors from the switchyard to Victorville.

ALL-AMERICAN CANAL, ARIZONA-CALIFORNIA

Actual construction work on the all-American canal began on August 8, 1934, when the Griffith Co. commenced excavation on rock cuts. At the end of the fiscal year this company had excavated approximately 497,000 cubic yards and their contract was nearly completed. The W. E. Callahan Construction Co. and Gunther & Shirley, whose contract covers the excavation of approximately 30 miles of the main canal involving about 39,400,000 cubic yards of excavation, began work on December 8, 1934. By the end of the fiscal year this company had completed 9 miles of the canal, involving the removal of about 9,200,000 cubic yards. As a relief measure for the farmers of Imperial Valley, who suffered severely from the unprecedented drought during 1934 when the Colorado River was at its lowest point in history, team excavation by Government forces was authorized for several miles of canal in the vicinity of Calexico. Farmers and farmer stock were employed insofar as possible. At its peak nearly 1,000 head of stock were engaged on this work. By the end of the fiscal year 9 miles of canal

excavation, involving the removal of approximately 1,487,000 cubic yards, had been completed by these methods.

Bids were opened on April 25, 1935, for the excavation of about 25 miles of the all-American canal across the East Mesa, involving the excavation of about 11,300,000 cubic yards, and contracts were awarded to Lewis-Chambers Construction Co., of New Orleans, La., and Mittry Bros., of Los Angeles. Although preparatory work was under way actual excavation had not commenced under either of these contracts by the end of the fiscal year. Designs and specifications for Imperial Dam and desilting works and other major structures along the canal were in course of preparation on June 30 and call for bids will be issued on these features as rapidly as they can be made ready.

ORLAND PROJECT, CALIFORNIA

Economic conditions showed an improvement over the previous year. A slight increase in prices afforded some relief. Butterfat, one of the project's major commodities, advanced in price to 37 cents a pound in the fall and winter months but declined again in the spring. Crop yields were fairly satisfactory and in one case quite surprising. The citrus-fruit yield was the greatest in the history of the project. For the first time in some years a market existed for low-grade figs and a large tonnage of fruit, which had formerly gone to waste, was marketed. The olive crop was very satisfactory both from the standpoint of yield and prices received.

Actual collections of reclamation charges showed a gain over those of the previous year, but were still rather light on account of the deferment of the payment of construction charges under the acts of April 1, 1932, and later acts. Relief under these acts has been of great aid to the water users. For the fiscal year 1935 the collections totaled \$36,858.67 as against \$32,330.77 for the previous year. Loans from the Federal land bank were of material assistance to the water users in enabling them to pay their operation and maintenance charges. The crop value per acre was \$33.64. Values of project farm and motor equipment showed a slight increase over 1934, but there was no general replacement of obsolete equipment. Livestock values showed a small net increase, although the value for sheep and hogs declined slightly. Population on the farms remained practically the same and bank deposits increased \$97,128. Oranges, almonds, olives, prunes, apricots, and turkeys were marketed largely through local cooperative marketing organizations.

Reduction in funds available prevented the carrying forward of the concrete lining program on laterals subject to excessive loss of water and high maintenance cost.

PARKER DAM PROJECT, ARIZONA-CALIFORNIA

Contract for construction of Parker Dam was let to Six Companies Inc., September 4, 1934, on their bid of \$4,239,834. The entire cost of this construction will be repaid by the Metropolitan Water District of Southern California under a contract with the Bureau. Work was started October 11, but was interrupted November 13 by the declaration of martial law by the Governor of Arizona in the area adjacent to the Arizona abutment of the dam. Work was resumed after the United States Supreme Court on February 11, 1935, issued a restraining order preventing interference by Arizona, but was again halted on April 29, when the Court rendered a decision holding that construction had not been authorized by Congress. No additional work was done on the dam itself to July 1, 1935. The contractor, however, completed his construction camp and the Bureau built a camp nearby for its employees.

GRAND VALLEY PROJECT, COLORADO

Crop values increased to \$37.35 per acre during 1934 from the 1933 average of \$21.75 on this project. Local showers prevented a water shortage that might have developed in the late summer owing to acute drought conditions on the watershed. There were 512 farms irrigated during the season, an increase of 42 over 1933 due principally to subdivision. The acreage planted to beans increased, and good prices for this crop were received. Water charges during the season were \$1.40 for 4 acre-feet, a reduction in 2 years of \$2.10 for this unit. The reduction resulted from economy in operation and lower labor and material costs on maintenance work. The Federal land bank made commissioner's loans on lands within the project for the first time in 1934. About 30 farms received such loans. All project banks were operating, except one at Fruita, Colo., which was merged with a Grand Junction, Colo., bank. They were operating in a more normal manner than during the previous year although a large part of the farm credit still was being provided by Government loan agencies. The beet-sugar factory at Grand Junction did not operate owing to reduced acreage. Cooperatives handled a large part of the project's potatoes and beans.

UNCOMPAHGRE PROJECT, COLORADO

During the 1934 irrigation season 1,578 farms were irrigated, 714 by owners, and the average crop value was \$21.94 an acre. This comparatively low per-acre crop value resulted from a shortage of water, recurrence of which will be prevented with completion of Taylor Park Dam. The price paid to farmers for their produce was up sharply

ver 1933, reaching a peak of 130 percent in some cases. Project sugar beets were handled by the sugar factory at Delta, while most of the potatoes and onions, poultry and dairy products were marketed through cooperatives. Three cooperative gasoline stations did a thriving business throughout the year. Construction of Taylor Park Dam, an earth-and-rock fill structure, which will supply supplemental water for the project, began on May 1, 1935, after the Uncompahgre Valley Water Users' Association entered a contract to repay its cost. The Water Users' Association also entered repayment contracts for rehabilitation of the South Canal and for drainage works.

BOISE PROJECT, IDAHO

The Arrowrock division is completely settled with a less percentage of uncultivated land than for many years. The proportion of tenantry is about stationary. The agricultural industries, such as creameries, condensaries, packing and canning plants, etc., continue as usual. Most of the agricultural industries are operated by cooperative organizations of water users. Associations of dairymen, poultry and egg producers, etc., operate widely and are prosperous with moderate competition by corporations. There is a gradual expansion of associations of users to deal in gas and oil, coal, groceries, etc.

No work has been under way on the Boise project except the enlargement of the Mora High Line culvert under the Oregon Short line near Mora and certain small drain extensions, all of which has been done by the water users.

Supplemental storage, repairs on the Arrowrock dam and Deer flat embankments and cleaning of drain ditches are needed.

A power plant and the Deadwood reservoir have been constructed but are being used for the Owyhee project. The Hillcrest division was contracted for Arrowrock storage and the diversion power plant.

MINIDOKA PROJECT, IDAHO

The total value of crops grown in 1934 was \$1,649,000. Less than 5,000 acres were cropped as compared with nearly 99,000 acres in 1933. There were 1,533 farms irrigated on the Gravity division and 43 on the South Side pumping division. About 60 percent of the farms of the pumping division were operated by owners, and 40 percent by tenants. Operation and maintenance charges, on both Gravity and Pumping divisions were well paid up. There was a heavy snowfall over the Upper Snake River drainage area during the winter of 1934-35, and the run-off in the spring was well maintained. In Jackson Lake, the maximum storage in 1935 was 713,460

acre-feet, and some 95,000 acre-feet of stored normal flow, including a small amount of holdover, were impounded. The supply of normal flow water was sufficient for all project demands, practically to the end of the fiscal year. The season of 1934, however, was the drier ever known, and all crops suffered severely. The Civilian Conservation Corps cleared the timber around Jackson Lake.

There is need for a more adequate water supply for the project especially in years of low stream-flow. One plan under consideration is to increase the height of the dam at American Falls to permit the storage of water in years of high run-off for use in years of shortage. Conservation in the use of winter water heretofore demanded for power and irrigation purposes is needed to increase the available supply for irrigation. A number of transfers of real estate were made. No new industries were established during the year, but a sugar factory, flour mills, and potato meal mill, two alfalfa meal mills, and a casein manufacturing plant were operated.

A contract completed with the Idaho Power Co. provided a means of conserving winter water for storage at American Falls reservoir.

A contract with the Minidoka Irrigation District provided that all power used in the district should be obtained from the Government plant at Black Canyon through exchange with the Idaho Power Co., the district agreeing to pay \$40,000 to \$50,000 yearly toward the construction cost of the plant, and in return to be credited with all receipts for power sold in the district.

UPPER SNAKE RIVER PROJECT, IDAHO

Island Park dam site was selected as the most feasible location to be found on Henrys Fork, and after extensive investigation of foundations plans were prepared and the work advertised for bids at the close of the fiscal year. In connection with this reservoir it is proposed to carry water through a crosscut canal from Henrys Fork to the Teton River to make stored water available to lands in that district, which canal will head at a low diversion dam about 6 miles above St. Anthony.

Investigations were continued at Ashton reservoir site on Henrys Fork near Ashton, but were abandoned in favor of cheaper storage at Island Park. A satisfactory reservoir site of about 50,000 acre-foot capacity was found on the Teton River, about 4 miles west of Driggs. Topographic surveys were completed and the dam site tested by diamond drilling and wash borings. Topographic surveys were made of Lake of the Woods and Grassy Lake reservoir sites just south of Yellowstone National Park, where it is hoped a combined storage capacity of 25,000 acre-feet may be obtained. Further diamond drilling is necessary to determine the feasibility of these

sites. The Spring Creek reservoir site is located on a small creek near Teton. Surveys and investigations of a foundation were made, but the probability of excessive leakage and excessive costs indicates further consideration of the site to be unwarranted.

The Fremont-Madison Irrigation District, embracing about 116,000 acres, was formed and an election held, at which a repayment contract with the United States was authorized. This contract covers the cost of Island Park dam, crosscut canal, and one or more small reservoirs on Falls River, and a reservoir on the Teton River.

BITTER ROOT PROJECT, MONTANA

The Bitter Root project has 18,240 acres irrigable, of which 16,000 are being farmed. There are 285 families, making a project population of 1,200 people. As a result of the Government loan, tax delinquent acreage has decreased from 6,000 acres in 1930 to 700 in 1935. Farmers are more hopeful.

The original Government construction appropriation did not fully complete rehabilitation of the project. The greatest needs at present include the replacement of one-half mile of wooden flumes and 5 wood stave siphons aggregating 1 mile in length, and a supplemental water supply by building 7 miles of ditch to adjoining watershed.

FRENCHTOWN PROJECT, MONTANA

The district lands are being dry farmed. Grain, the principal crop, is about 30 percent below normal. Some livestock is raised on the project and nearby range. Officials of the Amalgamated Sugar Co., which has a factory at Missoula, are convinced that sugar beets will quickly develop on the project lands as soon as irrigation water is available. Missoula has a population of 17,000 and 150 persons live in Frenchtown and Huson.

At the end of the fiscal year the final location of the main canal, 17 miles long, was completed and topographic surveys were made of more than 2,000 of the 7,500 acres of project lands. A complete topographic survey is being made, after which the laterals will be located. A small diversion dam will be constructed across a small side channel of the Missoula River.

HUNTLEY PROJECT, MONTANA

A total of 655 farms were in cultivation during the year, of which 338 were operated by owners and 317 by tenants. The value of crops was \$4 per acre higher than for the previous year. Sugar beets only showed a decrease, amounting to \$10.55 per acre. The

Wool Growers Association is active and markets practically all the lambs and wool grown on the project.

A permanent low-water dam, a reinforced concrete structure with rock and gravel core, was constructed across the main channel of the Yellowstone River below the project head gates. The dam has a crest length of 250 feet and a length over all of 324 feet, the height from foundation to crest is 10.5 feet, the width of the main structure 18 feet, and the width of the footings, 21 feet. A jetty, extending 101 feet into the river from the north bank, was completed. Its purpose is to divert the main current of the river toward the south bank and the dam, preventing any tendency to change the main channel of the river. Construction is of cribbing filled with rock.

MILK RIVER PROJECT, MONTANA

Excellent crops were produced on the project and the price level, especially for feed crops, exceeded that of many previous years. For the first time in the history of the project the gross crop revenue exceeded \$1,000,000. The financial condition of water users generally was consequently improved and there was a considerable liquidation of indebtedness incurred during the previous 3 years.

Sugar-beet yields were good and provided a maximum-capacity campaign for the Chinook factory.

The acreage farmed and irrigated during 1935 will exceed that of any previous year. One tract of 600 acres was purchased by the rural rehabilitation section of the A. A. A. and the 6 families from adjacent submarginal lands established thereon will be provided with suitable farm buildings and otherwise assisted in the development of their farms. Plans are being formulated for the colonization of several hundred farms during the year.

Operation and maintenance advances for the calendar year 1935 have been paid in full by all but two of the irrigation districts. These delinquencies, however, are slight and will be met before their requirement for the funds.

Work under the N. I. R. A. allotment of \$65,000 for the continuation of project construction was carried on throughout the fiscal year. This work involved two principal features: (a) The repair and improvement of the St. Mary Canal, consisting in the widening and strengthening of about 4 miles of canal bank and the placing of about 500 cubic yards of riprap to prevent excessive erosion, (b) the replacement of timber canal and lateral structures in the Malta and Glasgow divisions with structures in kind of concrete. Two major and 157 minor structures were constructed, involving 441 cubic yards of reinforced concrete, and replacing 147 deteriorated timber structures.

SUN RIVER PROJECT, MONTANA

The program followed since 1929 of changing the large grain acreage to alfalfa, sweet clover, forage, and cultivated crops was continued during 1934 and early 1935. Good progress was made with 5,500 acres of seed peas and a general increase in soil-building crops. The water supply for 1935 continued excellent, although the season on the project was one of the driest of record. Prospects for crops in 1935 were good. The Utah-Idaho Sugar Co. was making a detail survey regarding possibilities for a sugar factory. Concerted action developed among farmers for control of noxious weeds. Planting of shelter belts continued and community pastures were operating successfully. The Fort Shaw and Greenfields irrigation districts continued to operate the completed works successfully. Good progress on extensions to lateral system and drainage works was made under U. I. R. A. funds. Twenty-six miles of drain and some 14 miles of laterals and canal extension were completed. Contract was awarded to Tomlinson-Arkwright Construction Co. for construction of about 6 miles of laterals and structures in vicinity of Ashuelot and to C. G. Rowland for some 18 miles of drains and structures. Plans and estimates were completed for improving some 25 miles of Pishun and Sun River Slope canals. Gibson Reservoir should be enlarged and lateral system built on the Sun River Slope division.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

There were 524 irrigated farms on the project. Where there was no irrigation there was no crop.

The irrigated area was 36,348 acres. During the year 57 percent of the irrigated farms were operated by owners or managers and 43 percent by tenants. The demand for irrigated land was greater in the past year than for any year of the project's history. A great number of sales were made during the past year and all lands taken for nonpayment of taxes were sold. One tract of about 1,200 acres was sold at a cash sale and brought a return of \$17 an acre. Most of this was land that has not been farmed or developed for a number of years.

Both irrigation districts raised sufficient funds to keep the operation and maintenance work, as well as the purchase of new equipment, on a cash basis.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The deficient water supply on the project, which was only one-third of normal, resulted in reduced yields of nearly all crops. The yield of sugar beets was reduced to 8.3 tons per acre, as compared with

12.5 tons per acre the previous year. The yield of alfalfa was 1. tons, as compared with 2 tons per acre under normal conditions. The autumn and winter months continued extremely dry. Early in May 1935 the drought was broken by extensive rains over project land and the storage watershed. These rains put the land in good condition for spring planting and increased the storage water supply. Diversion of water for irrigation was not started until after June 15 and Pathfinder Reservoir was filled to 50 percent of its capacity. Guernsey Reservoir was filled, and Minatare Reservoir was about two-thirds filled. This is not a normal supply, but it was thought to be ample for the season's needs. The general economic condition of project farmers showed improvement during the past year in spite of the 1934 water shortage. Prices received for crops were good, and benefit payments for corn, hog, and sugar-beet farmers helped materially. The area reported cropped was 176,000 acres, as compared with 182,500 acres in 1933. Land sales showed increased activity although good farms were at a premium.

A new contract was executed with the Northport district which provides for smaller construction payments during the next few years and also for payment from the district's share of power revenues of \$6,000 annually to the farmers' irrigation district for the Northport district's water-carriage charges.

Construction was confined to completion of 10 miles of additional power-transmission line between Gering and Mitchell, Nebr., completing a loop circuit serving a total of nine project towns and making duplicate line service available to each town, thus reducing power-service interruption caused by line outages and resulting in improved service. The cost of the work was financed from power revenues. The irrigation districts were forced to expend unusually large sums in cleaning canals and laterals in the spring of 1935 as a result of sand storms during the winter of 1934-35.

HUMBOLDT PROJECT, NEVADA

Lovelock Valley received only 3,000 acre-feet of water to meet its requirement of approximately 84,000 acre-feet during the 1934 season, accentuating the economic difficulties of previous water shortages and universal depression. Returning confidence among the farmers of the district, inspired by the construction of Rye Patch Dam and the purchase of water rights in the Battle Mountain area for transfer to this project is evidenced by a marked improvement in business and banking conditions locally.

Award of contract was made on December 1, 1934, for the construction of Rye Patch Dam, J. A. Terteling & Sons being the lowest and successful bidder.

Subsequently plans were changed so as to provide for an additional 10 feet in height of the dam. Active construction work was commenced in February 1935, and was 16.9 percent complete on June 30, 1935. In the Battle Mountain area property was purchased aggregating approximately 60,000 acres. Surveys of this property and plans for river channel improvement, removal of old dams, and blocking of sloughs to prevent river overflow in these properties were in progress.

NEWLANDS PROJECT, NEVADA

The project water supply for the 1934 season was seriously short, necessitating a rigid plan for allotting all available water.

The water supply for lands under Lahontan reservoir was adequate during the winter 1934-35.

The First National Bank in Reno, Fallon branch, was opened on May 1, 1935.

The irrigated area totalled 41,070 acres, in addition to 7,600 acres in outside community pastures receiving some drainage waters. Farms operated by owners numbered 606 and by tenants 179. The total estimated value of all crops was \$737,164. In 1934 crop values increased \$116,674 above the 1933 totals.

Two E. C. W. camps were under construction near Fallon. The plan included such work as grubbing willows, cleaning ditches, building and repairing structures, riprapping around new structures, and replacing riprap around old structures where necessary.

During the winter of 1933-34 C. W. A. funds were made available for a limited amount of work on project drains, all of the work being done by hand labor. Improvement of roads now existing is proposed to facilitate operation of the distribution system, eliminate fence gates across such roads and substituting cattle guards therefor, providing bridges and culverts for ditch crossings and draining or grading operating roads upon the ditch rights-of-way.

Other maintenance work during the fiscal year included the installation of 21 concrete structures, 64 pipe or timber structures in the lateral system, and 13 pipe or timber structures in the drainage system.

TRUCKEE STORAGE PROJECT, NEVADA

Crop production, as a consequence of an inadequate water supply, was much below normal. Grass and fall alfalfa pasture, which were scarce and of poor quality, produced small revenue from feeder cattle. Hay in excess of farm demands was insufficient to provide the usual volume of cattle feeding during the winter. Investigations were made at one of the proposed dam sites on the Little Truckee

River. Topographic surveys of dam site and reservoir and diamond drill explorations of the Boca site at the junction of the Little Truckee River with the Truckee River were in progress at the close of the fiscal year. Form of agreement necessary to be executed by the Sierra Pacific Power Co., the Washoe County water-conservation district, and the Truckee-Carson irrigation district, and the United States was approved as to form.

CARLSBAD PROJECT, NEW MEXICO

There were 438 farms cultivated during the year, 290 by owners and managers and 148 by tenants. The total area cropped was 18,714 acres. Two farms were reported sold to local residents. Prices of farm land ranged from \$75 to \$250 per acre. No new farm loans were made by the Federal land bank. Payments on loans amounting to \$650,000, made by the loan agency, were resumed. Crop returns for 1934 averaged \$44 per acre, a decrease of \$3.39 per acre. Financial conditions of the project continued to improve. The local bank deposits were \$690,215 on June 30, 1934. Industrial developments were confined to the potash and oil industries. The U. S. Potash Co. mining and refinery operation was on a three-shift basis. Both reservoirs of the project were entirely empty on July 1, and there was insufficient water for crops during the remainder of the year. Sufficient water accumulated during the winter to permit a full supply for planting the 1935 crops, and there was sufficient water for all crops at the close of the fiscal year 1935.

Extension of the east embankment at Lake McMillan was started July 23 by F. E. R. A. forces and continued until September 22, when C. C. C. forces took over the work. On June 30 the job was 90 per cent completed.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

There were 4,956 irrigated farms in 1934, of which 3,018 were operated by owners or managers and 1,938 by tenants. The total area cropped in 1934 was 123,800 acres, as compared with 137,400 acres in 1931. A number of cold-storage, wholesale, and commission produce establishments serve El Paso's trade territory.

Weather conditions in 1934 were favorable and exceptional yields were obtained. The average gross return was \$76 per acre for the total area cropped of 124,000 acres, as compared with \$27.50 per acre in 1932. Crop financing was easily obtained. The mortgage indebtedness of the water users decreased. The total bank deposits increased from \$17,550,000 in 1931 to \$23,000,000 in June 1935. Collections for 1934 were unusually good and the classified area contracted

for water service in 1935 is the largest during the history of the project.

The most urgent engineering work is the extension or improvement of the drainage facilities for the remainder of the irrigable area of about 4,500 acres scattered throughout the project.

STANFIELD PROJECT, OREGON

The project is located in Umatilla County, eastern Oregon. It was originally constructed in 1905 by the Furnish Ditch Co. for the irrigation of approximately 10,000 acres in the vicinity of Stanfield, Oreg. The main canal diverts water from the Umatilla River. The water supply in part is obtained from the McKay Reservoir under contract for 15,000 acre-feet with the Bureau of Reclamation. An allotment of \$100,000 was made by the Public Works Administration for refinancing and rehabilitating the project, and a repayment contract with the Stanfield irrigation district was executed February 12, 1934. Rehabilitation work was continued during the past fiscal year on the irrigation structures and canals.

UMATILLA PROJECT, OREGON

The operation of the east and west divisions of the Umatilla project were continued under the respective irrigation district organizations, the combined irrigated area of the two divisions being approximately 11,000 acres, which in 1934 produced crops having an average value of approximately \$18 per acre. Stock, dairy, and poultry prices showed improvement over the previous year. An early watermelon crop was marketed to good advantage owing to the watermelon code and somewhat to the work-relief projects during the winter months. On the east division the cooperative creamery and cannery are proving advantageous to the farmers and townspeople.

VALE PROJECT, OREGON

There are 242 water users on the project and nearly all lands for which water is available have been settled. Twelve percent of the farms were operated by tenants. Crops were diversified, the largest acreage being planted to alfalfa and hay for winter forage. Alfalfa returned an average yield of approximately 4 tons per acre. From 450 acres of potatoes there was an average of 135 bushels per acre. Dairying is fast becoming an important industry. A creamery was recently established at Vale, receiving cream and poultry from the settlers. Cooperative organizations in the older agricultural sections, adjoining, offer facilities to settlers for cooperative marketing. Two highways and a market road furnish facilities for transportation.

Contract was awarded on January 26, 1934, for construction of the Agency Valley Reservoir and work was 66 percent completed at the close of the fiscal year. Awards were also made for the construction of 4.5 miles of road to replace the present county road around Agency Valley Reservoir and for the earthwork and structures on the Vale Main Canal.

KLAMATH PROJECT, OREGON-CALIFORNIA

During the calendar year 1934, 510 of 568 farms on the main division were farmed. The average value of crops was \$37.53 per acre, or an increase of \$5.28 per acre. On the Tule Lake division there were 334 farms, 333 of which were farmed. Crop values averaged \$48.73 per acre, an increase of \$18.73 over the previous year. Crops were excellent and prices fair, and with a continuation of these conditions all project farmers should be able to meet their contracted obligations. A supplemental contract providing for the extension of payments under the act of May 25, 1926, was executed by the Enterprise irrigation district. Supplemental contract with the Langell Valley irrigation district providing for the adjustment of the district's construction charges in accordance with the land classification made in 1934 is pending, awaiting the outcome of an election to be held this fall. The contract provides for the suspension of charges on 6,271 acres of the 14,353 acres in the district.

Construction work during the year was limited to enlarging and strengthening the dikes in the Tule Lake division and a small amount of work on the extension of the drainage system in the main division.

OWYHEE PROJECT, OREGON-IDAHO

With the aid of the Vale-Owyhee Land Settlement Association 6,400 acres of new lands on the project were sold, and united efforts will be made looking toward the sale of 35,000 acres of new lands for which water will be available in the spring of 1936. The Farmer's Cooperative Creamery at Payette, Idaho, continued to do a thriving business. Abundant crops selling at increased prices resulted in a decided economic improvement. All surplus marketable hay was sold and shipped to Middle Western States where drought conditions prevailed.

The construction of the project irrigation works was completed to permit the irrigation of approximately 10,000 acres of new lands in the spring of 1935. The North Canal was completed to the inlet of the Malheur River siphon. Work on the additional grouting of the foundation of the Owyhee Dam was about 30 percent completed at the end of the fiscal year.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

Financial progress was in evidence for the year ending June 30, 1935, largely because of more favorable prices received for farm products and the sugar-beet payments under the A. A. A. Alfalfa was in demand at prices ranging from \$12 to \$18 per ton in the stack. The total crop value was \$1,022,500, the highest for 5 years and an increase over the previous year of 41 percent. Closer settlement remains the principal need in the program for better farming and more production per acre. Federal rural rehabilitation, including transplanting of settlers, was seriously considered for the project. Twenty-five percent of the project farms are occupied by owners, 32 percent by tenants, and 43 percent are partially developed and would fit into the rehabilitation plans because of their productive soil.

Requests were made for P. W. A. allotments totaling \$100,000 to cover the replacement of North Canal wood siphon and culverts under North Canal, Johnson lateral storage and drainage extensions. The replacement of North Canal wood siphon and culverts under North Canal was being taken care of under operation and maintenance assessments, and the Johnson lateral storage was being considered for E. C. W. construction.

HYRUM PROJECT, UTAH

The Hyrum project, when completed, will furnish supplemental water supply to approximately 10,000 acres of privately owned land in the southern part of Cache County, Utah, which are now inadequately supplied with water. Project lands with the better water rights produce fair yields of alfalfa, sugar beets, and small fruits. Land adjacent to the project having first-class water rights produces excellent yields of alfalfa, sugar beets, peas, beans, and small fruits. The principal industries of the project and the adjacent area include dairying, and the raising of sugar beets. The snow cover at the last of April was above the average as was its water content.

At the end of the fiscal year 1935 the construction of Hyrum Dam and appurtenant structures was 96.4 percent complete. On November 20, 1934, contract was awarded to J. A. Terteling & Sons, of Boise, Idaho, for the construction of earthwork on the canal system. At the end of the fiscal year this work was complete. Award of contract for the construction of structures below the dam, including pumping plant and pipe line, concrete siphon, bench flume, and other structures was made to Knowlton & Rupert, of Layton, Utah, on February 6, 1935. At the end of the fiscal year this work was 87.9 percent complete.

MOON LAKE PROJECT, UTAH

Actual construction of Moon Lake Dam was started May 7, 1935. Results to June 30, 1935, comprise the excavation of 32,260 cubic yards of material in the outlet tunnel, open cut for intake and outlet structures, and spillway intake. Completion within the present calendar year of the outlet tunnel is anticipated which will permit diversion through the completed tunnel of the run-off from melting snows early in 1936, when work on the earth-fill portion of the dam will be undertaken. The reservoir to be formed by the construction of Moon Lake Dam will have a storage capacity of 30,000 acre-feet supplying water for 85,000 acres of homestead lands under cultivation now suffering from a water shortage because of rights secondary to Indian allotted lands.

OGDEN RIVER PROJECT, UTAH

The purpose of the Ogden River project is to furnish a supplemental water supply for lands that are already in a high state of cultivation. The land is all in private ownership. Marketing conditions, cooperative marketing associations, canneries, sugar-beet factories, and other facilities are now well established on the Ogden River project. Project lands which are to receive a complete new water supply comprise such a small proportion of area farmed that they will have little effect on the whole.

The construction of this project contemplates the building of Pine View Dam and Reservoir, a 75-inch wood-stave pipe line from the dam to the mouth of Ogden River Canyon, about 25 miles of canal north to Brigham City, and about 8 miles south to the Ogden Airport to distribute stored water to the lands that have had an inadequate water supply. On September 13, 1934, contract was awarded to the Utah Construction Co. and Morrison-Knudsen Co. for construction of the dam and appurtenant works. The contract was about 40 percent completed at the end of the fiscal year.

PROVO RIVER PROJECT, UTAH

This project involves the construction of a storage dam and reservoir on the Provo River 13 miles east of Provo. An earth-fill dam will raise the water surface about 195 feet, giving a reservoir capacity of 170,000 acre-feet, which water will serve as a supplemental supply for the irrigation of 36,000 acres in the Utah and Salt Lake Valleys. Water for the reservoir will be obtained principally by diverting a portion of the Weber River through the Weber River Diversion Canal which is to be enlarged, and by diverting surplus water from the headwaters of the Duchesne River through the con-

struction of a 5½-mile tunnel. A second division of the project involves the construction of a dike across Utah Lake for the purpose of decreasing evaporation by reducing the water surface area. A water users' association has been organized, the stockholders of which will consist of several irrigation companies and three metropolitan water districts. The irrigation companies are in the process of qualifying for participation in the project. The three districts have been formed preparatory to qualifying as subscribers for stock in the association. An allotment of \$2,300,000 is available for beginning the construction of the project.

SANPETE PROJECT, UTAH

The work planned for the project covers the construction of two tunnels, one on the Ephraim division 7,200 feet long with a capacity of 100 second-feet, with short feeder canals; and on the Spring City division a similar tunnel 5,000 feet long with short feeder canals. Water diverted through the two tunnels will be used as a supplemental irrigation supply on about 8,000 acres of land near Ephraim and Spring City. Repayment contracts have been obtained from both project divisions, and a contract has recently been awarded to the Morrison-Knudsen Co. for the construction of the Ephraim Tunnel. An allotment of \$375,000 is available for the construction of the two tunnels. The feeder canals are being constructed with the use of an E. C. W. camp.

STRAWBERRY VALLEY PROJECT, UTAH

Spring conditions were ideal and it was not necessary to withdraw water from storage until June 9. Early crops had matured. Because of the lack of uniformity of water supply the sugar-beet acreage planted in 1935 was small. However, exceptional yields from acreage planted to peas will tend to counterbalance the sugar-beet situation. Poultry operations again proved to be the most productive secondary industry of the farming population. Utah eggs have gained a quality reputation on the New York market and the season's prices were firm. The industry also is serving the important function of a home market for the grain crops produced. Last year the project failed to produce enough wheat to feed its chickens and supply the general cereal requirements.

During the past year investigation was made of the possibilities of diverting additional water into present storage facilities.

It is anticipated some additional water will be made available to the project in the spring of 1936 through a new diversion canal under construction by the Currant Creek C. C. C. Camp.

WEBER RIVER PROJECT, UTAH

The Echo Reservoir, on the Weber River, with a capacity of 74,000 acre-feet, was constructed in 1930 for the purpose of providing a supplemental water supply for the irrigation of 70,000 acres of land in the lower Ogden and Weber Valleys, and 15,000 acres in the Provo River Valley. The reservoir was used to nearly its full capacity in 1932 and 1933, and was filled to one-half its capacity in 1934, the year of lowest precipitation on record in the Salt Lake Basin. The 1934 storage supply saved the project from a total crop failure during the drought period, as indicated by an average crop value of \$27 per acre.

COLUMBIA BASIN PROJECT, WASHINGTON

Work under the contract for construction of Grand Coulee Dam and power plant was started on September 25, 1934. Erection of contractor's buildings, general offices, houses for employees, hospital, and other buildings to accommodate 2,700 workmen was completed. Excavation operations for removing overburden for dam and powerhouse foundations were started on both sides of the river in October. The belt conveyor for the west-side excavation was placed in operation in December and pile driving in the west cofferdam commenced January 1, 1935. The cofferdam was completed in April and by June 30, 1935, approximately 8,000,000 cubic yards of excavated material had been moved out. Placing of concrete in the dam was expected to start about October 1, 1935. Thirty percent of the contract work had been completed by the end of the fiscal year.

On June 5, 1935, the Secretary issued an order for change to the contractor, directing the company to construct the foundation for the high dam and power house in lieu of the low dam and power house as indicated in the specifications on which the bid was made. The Government headquarters camp, including water and sewage systems, administration building, 60 residences, 2 dormitories, schoolhouse, warehouse, 4 temporary dormitories, and 24 cottages and other facilities was nearing completion. Paving of highway and streets was well advanced. The United States construction railroad from Odair was nearly completed, including tracks to the warehouse.

OKANOGAN PROJECT, WASHINGTON

The gravity system furnished 2 acre-feet per acre "new" water during 1934 and the set-up for the current year is on a basis of 2½ acre-feet "new" water per acre with prospect of a good carry-over. The irrigated acreage for 1934 decreased slightly. The year 1935 will probably show a small increase. A branch of the Production Credit

Association was placed in Okanogan and most of the project farmers obtained their finances for their 1935 operations through this source. The 1934 apple crop was the largest, considering the reduced acreage, ever harvested although returns were poor. The current crop will be about normal with prospects for a good return. The cherry market for 1935 was good and brought in considerable money at a time when it was badly needed. The pear market was expected to bring \$25 to \$40 per ton. The Okanogan Growers' Union is constructing a 110-car cold-storage plant at Okanogan which will make the combined cold-storage capacity of Okanogan and Omak about 410 cars.

During the spring of 1935 the district lined 3,485 feet of the Upper Main Canal at a cost of \$5,501.14. The yardage placed was 437.5 cubic yards, or unit cost of \$12.574 per cubic yard. The ditch lined was originally designed for a far larger carrying capacity and the reduction in size entailed the placing of some 3,000 cubic yards of backfill.

YAKIMA PROJECT, WASHINGTON

SUNNYSIDE AND TIETON DIVISIONS

The 1934 water supply was ample for all needs and the irrigated areas remained about the same. Because of an early spring and the resultant long growing season, the diversion and delivery duty for both divisions was the lowest of record. Better prices for some crops and increased yields of fruits resulted in average per-acre values of \$39.15 and \$122.87 for the Sunnyside and Tieton divisions, respectively. Financing of growers by various governmental loan agencies was especially helpful. Apples, hay, potatoes, and rutabagas remaining from the 1934 crop were cleaned up at attractive prices. Movement of farmers from the drought areas of the Middle West was evidenced. The cold-storage capacity of the Naches plant of the Yakima County Horticultural Union was increased 175 cars by an addition to its existing plant. The regular program of operation and maintenance on the two divisions included a heavier program of minor structure replacement.

KITTITAS DIVISION

A normal water supply was available in 1934 for the irrigation of 52,071 acres, an increase of 17 percent over 1933. The principal crops were alfalfa, hay, peas, oats, potatoes, and barley. There was a marked increase in the seed-pea acreage. The average per-acre value of crops was \$18.98. Credit facilities were easier than in previous years and land sales were being held to conservative figures. There was much interest in settlement opportunities. Dur-

ing the year a cannery was established and handled a considerable acreage of peas and sweet corn. Late in 1934 the Milk Products Co. opened a new plant with modern equipment. The operation and maintenance of the division was carried on by the Kittitas reclamation district.

KENNEWICK DIVISION

The average per-acre value of crops amounted to \$67.62 for a net cropped area of 2,158 acres. Apples, alfalfa, hay, potatoes, and asparagus were the principal crops. A new cannery at Kennewick costing \$30,000 provided a market for asparagus growers.

STORAGE DIVISION

A heavy program of maintenance and betterment work was completed in the fall of 1934. At Tieton Dam extensive repairs were made to the basin at the lower end of the spillway chute. At Bumping Lake repairs and improvements were made. At Cle Elum Reservoir rather extensive repairs to the cylinder gates were made. Maximum storage on hand for the 1935 season was reached on June 16, with 938,962 acre-feet. Construction of temporary E. C. W. camps BR-49 and BR-50, to be located at Clear Creek and Kachess Reservoirs, were started in June 1935 by Army officers from Camp Lewis.

CASPER-ALCOVA PROJECT, WYOMING

Construction was continued with funds allotted by the Public Works Administration. One and one-half miles of road were constructed, completing the West Side Service Road and its extension to Seminole Dam site. Three hundred sixty acres of land in the Seminole Reservoir area were cleared. Construction of the Alcova diversion and outlet tunnel was completed. All tunnel and open canal excavation and the construction of two concrete siphons on the Casper Canal were completed. Concrete lining in tunnel no. 1 was completed and the lining of tunnel no. 2 was 50 percent complete. Thirty-one miles of power transmission line and $4\frac{1}{2}$ miles of telephone line were constructed, completing these lines to Seminole Dam. Invitations for bids were issued June 8 and 15 for the construction of Alcova Dam and Seminole Dam and power plant, respectively, and work was expected to start the latter part of the summer. Construction of the Casper Canal under present contracts will be continued and carried to completion. Construction will also be commenced on the remainder of the Casper Canal and on the lateral system. Draft of revised repayment contract with the Casper-Alcova irrigation

district was approved by the Department April 23, 1935, and its execution by the district board of commissioners was authorized by the electors of the district at an election held May 25, 1935.

RIVERTON PROJECT, WYOMING

In 1934 the water supply was ample and crop values per acre showed a substantial increase owing to better prices. The 1935 season was marked by an increase of more than 80 percent in the number of settlers and in the area under cultivation. Twenty additional settlers either made homestead entry or purchased private land with a view to developing it in 1936. Crops were in good condition though rather late because of the cold spring. A substantial acreage of sugar beets was grown on the project for the first time and a rather large acreage was planted to beans. There was little money in circulation, but there was a general optimism among the settlers. All water users had paid the advance water-rental charge for 1935 and there were no delinquent charges on the project books. More good roads are needed. There is still room for additional settlers.

SHOSHONE PROJECT, WYOMING

The project water supply was ample. Crop production greatly exceeded that of the previous year on all three divisions of the project. The average per acre crop return on the Garland division was \$24.38, compared with \$20.22 for 1934; on the Frannie division \$11.77, compared with \$9.26; and on the Willwood division \$15.76, compared with \$8.97. The potato crop was poor. Shipments of agricultural products totaled 1,397 carloads, compared with 1,133 the previous year. Livestock shipments numbered 136 carloads, compared with 128 in 1934. Current crop conditions at the end of the fiscal year were excellent. Settlement activity showed a decided increase over the previous year, owing to the drought in the Middle West. Forty-eight homestead entries were made on the Willwood division, involving an irrigable area of 3,213.86 acres. Ten applicants for farm units on the Willwood division paid the 1935 water-rental charges on 766.95 irrigable acres of land. At the end of the fiscal year 14 vacant farm units remained on the Willwood division. The plant of the Associated Seed Growers was enlarged during the year to provide more storage space and accommodations for a larger number of employees. The area planted to seed peas and beans increased to approximately 4,200 acres. The Big Horn Marketing Association planned to enlarge its plant. A potato-marketing association is active. Construction on the Willwood division consisted of 7.55 miles of open drains and 3.13 miles of closed drains.

SECONDARY INVESTIGATIONS

Investigations of proposed projects were carried out at a total cost of \$202,000, mainly with funds allotted under the National Industrial Recovery Act of June 16, 1933. Principal among these were:

ARIZONA

An initial unit of the Gila Valley project to irrigate 150,000 acres at a cost of \$19,475,000. Report dated December 10, 1934.

COLORADO

A start on the survey of the Grand Lake-Thompson River transmountain diversion.

IDAHO

Surveys, drilling, plans, and estimates for reservoirs on South Fork of Snake River, together with a study of water supply conditions generally in the Upper Snake River Valley, with a report thereon in June 1935.

MONTANA

Surveys were completed for the Buffalo Rapids project to irrigate about 50,000 acres near Miles City.

NEBRASKA

A general water supply study for utilization of Platte River waters was started, accompanied by drilling of dam sites along North Platte River near Keystone.

OREGON

A report was submitted in October 1934 for the irrigation of 47,000 acres in Baker Valley by means of a reservoir on Powder River and utilization of ground storage by pumping at a cost of \$3,662,000. A report of October 1934 found the diversion of Burnt River to Willow Creek infeasible and suggested a reservoir of 25,000 acre-feet at a cost of \$550,000 for the use of Burnt River areas. Irrigation use of Umatilla River flood waters was found too costly in a report of April 1935. On Deschutes River the newly found Wikiup reservoir site will enable conservation of most of the winter waters now escaping unused as to irrigation.

TABLES

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1935*

DEBIT SIDE

Construction account:

Primary projects:

Cost of irrigation works:

Original construction.....	\$223, 206, 147. 16
Supplemental construction.....	12, 646, 037. 98
Value of works taken over.....	2, 056, 939. 90

Total construction cost..... \$237, 909, 125. 04

Operation and maintenance prior to public notice,
net..... 2, 803, 615. 15

Operation and maintenance deficits and arrear-
ages funded with construction..... 5, 321, 099. 99

Penalties on water-right charges funded with con-
struction..... 1, 882, 037. 15

10, 006, 752. 29

Total..... 247, 915, 877. 33

Less income items:

Construction revenues..... 6, 729, 587. 10

Contributed funds..... 1, 781, 257. 31

Nonreimbursable appropriation, Rio Grande

Dam..... 1, 000, 000. 00

9, 510, 844. 41

Total..... 238, 405, 032. 92

Less abandoned works, nonreimbursable cost, and charge-offs..... 17, 112, 430. 10

Balance payable..... \$221, 292, 602. 82

Yuma auxiliary project:

Cost of irrigation works..... \$899, 837. 00

Impounded funds, economy acts..... 504. 96

900, 341. 96

Less construction revenues..... 1, 085. 47

899, 256. 49

Palo Verde flood protection cost of reconstruction and repairs..... 48, 917. 67

Tennessee Valley Authority:

Cost of designs..... 371, 443. 80

Less contributed funds..... 371, 443. 80

Secondary projects and general investigations:

Cost of surveys and investigations..... 3, 336, 711. 44

Less contributed funds..... 629, 294. 43

2, 707, 417. 01

General officers' expenses undistributed.....

126, 823. 03

Plant and equipment.....

647, 914. 57

Materials and supplies.....

1, 269, 639. 49

Accounts receivable:

Current accounts..... 989, 610. 54

Deferred accounts..... 162, 147, 750. 72

163, 137, 361. 26

Undistributed clearing cost accounts.....

119, 427. 90

Unadjusted debits disbursement vouchers in transit.....

67, 755. 41

Cash:

Balance on hand:

Reclamation funds..... \$7, 683, 224. 41

Yuma auxiliary fund..... 143, 406. 09

Special funds..... 67, 128. 45

National Industrial Recovery—Interior, reclama-

tion, allotments..... 38, 291, 213. 35

Public Works Administration allotments..... 500, 248. 11

Contributed funds..... 42, 131. 37

46, 727, 351. 78

In special deposit and in transit..... 43, 923. 86

46, 771, 275. 64

Total debits..... 437, 088, 391. 29

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1935—Con.*

CREDIT SIDE

Security for repayment of cost of irrigation works:		
Contracted construction repayments.....	\$205,627,263.04	
Yuma auxiliary contracted repayments.....	604,052.99	
		\$206,231,316.03
Current accounts payable.....		3,739,072.85
Deferred and contingent obligations.....		1,640,685.24
Reserves and undistributed profits.....		7,905,336.71
Operation and maintenance results, surplus.....		615,401.30
Unadjusted credits, collection vouchers in transit.....		5,071.08
Government aid for reclamation of arid lands:		
Reclamation fund.....	160,182,375.99	
Advances to reclamation fund:		
Treasury loan (act of June 25, 1910).....	\$20,000,000.00	
Less amount repaid.....	10,000,000.00	
Total.....	10,000,000.00	
Treasury loan (act of Mar. 4, 1931).....	5,000,000.00	
		15,000,000.00
National Industrial Recovery, Interior, reclamation.....		56,941,000.00
Public Works Administration.....		510,000.00
Special funds:		
Increase of compensation.....	2,797,960.33	
Rio Grande Dam.....	1,000,000.00	
Wind River Indian, Riverton.....	359,176.04	
Judgments, United States courts.....	602,814.38	
Drainage and cut-over lands.....	99,815.08	
General investigations, 1923 to Dec. 31, 1924.....	266,352.66	
Arid, semiarid, swamp, and cut-over timberlands.....	35,923.75	
Columbia Basin irrigation project.....	11,634.28	
Colorado River levee system.....	445,110.59	
Palo Verde flood protection.....	49,369.43	
Claims for damages, act of Dec. 28, 1922.....	239.23	
Total.....	238,301,771.76	
Less nonreimbursable appropriation, Rio Grande Dam.....		1,000,000.00
Total.....		237,301,771.76
Less impairment of funds:		
Abandoned works.....	\$2,834,984.62	
Nonreimbursable construction cost.....	790,928.42	
Operation and maintenance cost uncollectible.....	453,272.39	
Charge-offs, act of May 25, 1926.....	14,652,339.58	
Washington office cost since Dec. 5, 1924.....	1,349,951.51	
Attendance at meetings.....	1,815.90	
Giving information to settlers cost.....	3,576.95	
Prepaid civil-service retirement fund.....	2,340.33	
Returned to Treasury, miscellaneous receipts.....	6.89	
		20,089,216.59
Total.....		217,212,555.17
Less impounded funds, economy acts, reclamation fund.....		261,047.09
		216,951,508.08
Total credits.....		437,088,391.29

RECLAMATION TABLE 2.—Available funds, expenditures, and balances, fiscal year 1935

Items	Funds						
	Reclamation	Yuma auxil- iary	Colorado River levee system	Palo Verde flood protection	National In- dustrial Re- covery Act	Tennessee Valley Au- thority	Working funds, N. I. R. A.
Balance on hand July 1, 1934.....	\$4,737,153.39	\$148,253.80	\$56,963.29	\$562.97	\$56,425,099.69	\$61,067.00	\$562.99
Receipts:							
Proceeds from sale of public lands.....	204,856.67						
Proceeds from oil leasing act.....	1,838,257.77						
Proceeds from potassium royalties.....	31,302.76						
Proceeds from Federal power licenses.....	86,514.42						
From project collections.....	2,355,673.73	20,770.69	325.62		82,239.46		107.19
From general treasury.....					1,984,000.00	205,031.82	50,000.00
Contributed funds.....							
Total.....	9,253,164.74	169,024.49	57,288.91	562.97	54,525,339.15	266,098.82	50,670.18
Expenditures:							
Disbursements.....	1,549,920.33	25,618.40	20,684.00		15,731,877.69	236,138.25	23,759.31
Impounded funds, act of June 30, 1932.....	20,020.00						
Total.....	1,569,940.33	25,618.40	20,684.00		15,731,877.69	236,138.25	23,759.31
Balance on hand, June 30, 1935.....	7,683,224.41	143,406.09	36,604.91	562.97	38,791,461.46	28,960.57	26,910.87

1 Contra.

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Potassium royalties and rentals ¹	Total to June 30, 1935
	Fiscal year 1935	To June 30, 1935	Fiscal year 1935	To June 30, 1935		
Alabama.....			\$4,755.46	\$174,849.63		\$174,849.63
Arizona.....	\$14,967.79	\$2,659,577.35		159.86		2,659,737.21
California.....	22,541.34	8,151,934.44	927,881.36	11,285,177.30	\$181,358.11	19,618,469.85
Colorado.....	18,673.00	10,250,897.85	39,980.39	497,192.71		10,748,090.56
Idaho.....	9,551.45	6,997,458.74	1,181.04	15,396.29		7,012,855.03
Kansas.....	136.27	1,033,058.76				1,033,058.76
Louisiana.....			4,464.39	39,058.31		39,058.31
Montana.....	22,342.24	15,306,591.60	37,374.34	1,096,055.67		16,402,647.27
Nebraska.....	² 896.39	2,094,196.82				2,094,196.82
Nevada.....	485.33	1,021,429.87	168.00	5,111.37		1,026,541.24
New Mexico.....	47,727.95	6,608,876.24	108,092.19	528,901.65		7,137,777.89
North Dakota.....	442.66	12,217,746.08	8,438.71	126,098.64		12,343,844.72
Oklahoma.....	849.14	5,929,061.55	(?)			5,929,061.55
Oregon.....	6,235.85	11,957,500.92	1.51	10.28		11,957,511.20
South Dakota.....	1,923.74	7,728,144.47	133.28	1,511.36		7,729,655.83
Utah.....	9,193.12	4,223,602.64	27,019.62	417,390.46		4,640,993.10
Washington.....	3,409.33	7,443,477.78	529.17	33,749.63		7,477,227.41
Wyoming.....	47,273.85	8,588,648.98	678,241.33	32,914,649.96		41,503,298.94
Total.....	204,856.67	112,212,204.09	1,838,257.77	47,135,313.12	181,358.11	159,528,875.32
Proceeds, Federal water power licenses.....						³ 653,500.67
Grand total.....						160,182,375.99

¹ Proceeds for fiscal year, \$31,302.76.² Contra.³ Proceeds for fiscal year, \$86,514.42.

RECLAMATION TABLE 4.—Consolidated statement by projects of construction cost of irrigation works, other items reimbursable with construction, and amounts repayable

[illegible]

2 Contr.

Oregon:	281,591.64			173.09	5,003.00		276,761.73
Baker.....	2 5,361.52					2 5,361.52	
Deschutes.....	51,718.87					51,718.87	83,412.64
Stanfield.....							4,393,974.62
Umatilla.....	5,137,937.29		337.68	230,874.46	86,496.22	888,340.82	4,235,695.83
Vale.....	4,205,592.29	108.16			9,053.32		6,230,294.54
Oregon-California: Klamath.....	6,297,904.60	1,931.46			228,103.50	7,499.72	14,223,020.08
Oregon-Idaho: Owyhee.....	14,231,829.63	2 3,457.37	2,730.77	87,817.33	5,088.18		342.63
South Dakota: Belle Fourche.....	906.63			680,198.89	25,651.26	379,031.58	4,796,088.76
Utah:	4,522,631.74						
Hyrum.....	594,709.77	767,457.79			9,994.13		584,715.64
Moon Lake.....	96,003.95				14.00		95,989.95
Ogden.....	962,064.00	962,064.00			849.20		961,214.80
Salt Lake Basin.....	1,358.42	2,915,885.40			45,935.77		2,885,920.78
Provo River.....	27,149.72	27,149.72	9,100.33	13,971.15			27,149.72
Sanpete.....	14,382.18				5.50		14,376.68
Strawberry Valley.....	3,507,423.49	10,744.06		89,046.89	258,379.12		3,348,835.32
Washington:							
Grand Coulee.....	10,607,927.74	11,419,069.96			54,809.59		11,364,260.37
Okanogan.....	1,452,129.45				6,630.78		2,799.41
Yakima.....	1,167.51	26,077,256.88			444,567.25		27,877.20
Wyoming:							
Casper-Alcova.....	1,159,971.58	1,772,370.03			21.00		1,159,953.58
Riverton.....	267,809.09	4,161,465.59			20,172.65		279,041.83
Shoshone.....	31,208.97	10,016,056.10			432,598.47		1,019.70
Total.....	17,540,530.23	237,909,125.04	2 1,129.85	7,203,009.03	9,501,512.83	17,112,430.10	221,301,806.29

2 Contra.

3 Minidoka-Gooding combined with Minidoka in this report.

RECLAMATION TABLE 5.—*Accounts receivable, construction water-right charges*¹

State and project	Due		Collected			Uncollected June 30, 1935
	Fiscal year 1935	To June 30, 1935	Cash		Other credits to June 30, 1935	
			Fiscal year 1935	To June 30, 1935		
Arizona:						
Salt River.....	\$152,490.32	\$6,658,744.41	\$152,490.32	\$6,658,744.41		
Yuma auxiliary.....	1,274.57	595,220.08	2,148.78	590,523.01	\$1,625.26	\$3,071.81
Arizona-California: Yuma	² 88,679.02	3,814,253.74	² 104,483.80	3,275,001.98	535,780.18	3,471.58
California: Orland.....	15,668.84	819,243.96	491.82	773,815.10		45,428.86
Colorado:						
Grand Valley.....	² 201,710.21	159,183.29	² 210,500.00	80,729.94	78,453.35	
Uncompahgre.....	² 180,568.43	490,112.77		427,247.72	62,865.05	
Idaho:						
Boise.....	15,139.17	4,016,041.72	15,139.17	3,988,848.43	27,193.29	
King Hill.....	² 90,825.66		² 8,025.66			
Minidoka ³	² 710,865.35	8,004,607.86	² 835,145.32	7,221,209.15	761,472.64	21,926.07
Montana:						
Huntley.....	436.43	559,136.18	² 567.40	467,422.90	91,713.28	
Milk River.....	18,440.00	76,762.76		3,002.76		73,760.00
Sun River.....	9,631.32	218,910.46	² 9.95	206,223.64	12,590.81	96.01
Montana-North Dakota:						
Lower Yellowstone.....	1,660.82	292,157.95	1,305.80	291,490.50	667.45	
Nebraska-Wyoming:						
North Platte.....	99,908.37	3,977,258.65	² 28,408.13	2,780,919.81	1,139,200.84	57,138.00
Nevada: Newlands.....	29,258.74	1,185,020.66	22,916.94	1,115,983.44	67,745.94	1,291.28
New Mexico: Carlsbad.....	² 7,256.78	885,694.99	² 7,183.52	885,613.74	81.25	
New Mexico-Texas: Rio Grande.....	² 370,925.00	3,092,524.45	² 370,178.36	2,781,599.45	310,925.00	
Oregon:						
Baker.....	² 5,000.00		² 5,000.00			
Umatilla.....	1,432.50	540,573.88	1,208.50	399,670.19	5,190.89	135,712.80
Vale.....	² 5,000.00		² 5,000.00			
Oregon-California: Klamath.....	29,421.52	1,144,452.14	20,563.65	1,133,133.34	2,696.67	8,622.13
Oregon-Idaho: Owyhee.....	² 4,354.61		² 4,354.61			
South Dakota: Belle Fourche.....	² 5,180.82	624,129.09	² 5,180.82	545,855.04	78,274.05	
Utah:						
Salt Lake Basin.....	² 43,742.77	1,222.50	² 43,742.77	1,222.50		
Strawberry Valley.....	86,315.20	1,373,745.50	60,619.54	1,338,297.09	9,752.75	25,695.66
Washington:						
Okanogan.....	² 37,845.29	134,649.92	425.94	134,649.92		
Yakima.....	77,906.88	6,734,512.96	² 14,529.42	6,590,023.59	36,363.75	108,125.62
Wyoming: Shoshone.....	154,475.91	982,310.42	² 1,471.35	819,896.47	162,219.54	194.41
Total.....	² 1,058,493.35	46,380,470.34	² 1,366,470.65	42,511,124.12	² 3,384,811.99	484,534.23
Paid in advance of due dates.....			² 166,350.59	978,261.12	² 230,857.04	
Refunds.....			335.40	98,926.60	3,212.84	
Total collections.....			² 1,532,485.84	43,588,311.84		
Contributed funds applying to construction cost, not included in above table.....				1,781,257.31		

¹ Contributed funds amounting to \$1,733,013.08 excluded from this table in this report.² Contra.³ Minidoka-Gooding combined with Minidoka in this report.⁴ Other credits for fiscal year, \$450,292.07.⁵ Increase for fiscal year, \$24,088.18.

RECLAMATION TABLE 6.—*Accounts receivable, operation, and maintenance charges (after public notice)*

State and project	Due		Collected			Uncollected June 30, 1935
	Fiscal year 1935	To June 30, 1935	Cash		Other credits to June 30, 1935	
			Fiscal year 1935	To June 30, 1935		
Arizona: Yuma auxiliary	\$15,138.93	\$468,392.93	\$20,954.93	\$445,415.57	\$12,441.81	\$10,535.55
Arizona-California: Yuma	105,880.87	3,772,443.71	113,717.25	3,568,208.29	177,292.01	26,943.41
California: Orland	34,036.06	635,143.38	31,280.84	576,002.43	24,065.84	35,075.11
Colorado:						
Grand Valley	49,843.39	358,516.24	40,958.69	337,516.24	21,000.00	
Uncompahgre		1,008,683.69		977,809.79	30,873.90	
Idaho:						
Boise	11,346.14	2,171,237.74	8,346.14	2,115,588.02	52,649.72	3,000.00
King Hill		60,711.27		59,192.22	1,519.05	
Minidoka ¹	48,542.59	2,071,253.71	40,903.33	1,948,404.33	122,753.31	96.07
Montana:						
Huntley		554,787.34		543,594.31	11,193.03	
Milk River	33,997.49	331,461.07	38,301.28	309,784.64	1,662.25	20,014.18
Sun River	2,400.00	168,718.50	2,400.00	164,366.28	4,352.22	
Montana-North Dakota: Lower Yellowstone	.02	340,484.01	.02	340,479.38	4.63	
Nebraska-Wyoming: North Platte	18,737.60	1,911,130.22	16,594.25	1,838,806.93	64,687.83	7,735.46
Nevada: Newlands		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad	35,918.93	933,405.25	35,966.93	916,532.54	16,872.71	
New Mexico-Texas: Rio Grande	263,981.06	4,049,570.40	280,212.58	3,804,797.41	227,923.61	16,849.38
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon:						
Umatilla	3,106.33	385,601.65	3,106.33	378,347.69	7,253.96	
Vale	2,286.59	10,786.59	6,536.59	10,786.59		
Oregon-California: Klamath	50,769.47	1,290,526.59	50,377.11	1,255,686.56	30,536.22	4,303.81
Oregon-Idaho: Owyhee	250.00	250.00	250.00	250.00		
South Dakota: Belle Fourche	67,500.00	1,132,309.36	67,500.00	1,122,933.37	9,375.99	
Utah: Strawberry Valley		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan		371,441.72		368,788.67	2,653.05	
Yakima	216,965.32	5,379,384.34	219,298.41	5,196,637.53	64,148.75	118,598.06
Wyoming: Shoshone	2,428.45	554,072.96	2,371.17	529,328.73	23,705.43	1,038.80
Total	963,129.24	29,548,135.28	979,075.85	28,346,541.44	² 957,404.01	244,189.83
Paid in advance of due dates			69,285.43	138,907.32	³ 22.26	
Penalties and interest			7,343.84	512,858.94	⁴ 20,480.00	
Refunds				38,228.87	156.09	
Total collections			1,055,705.12	29,036,536.57		

¹ Minidoka-Gooding combined with Minidoka in this report.² Other credits for fiscal year, \$23,585.19.³ Increase for fiscal year, \$5.73.⁴ Decrease for fiscal year, \$400.

RECLAMATION TABLE 7.—*Accounts receivable, rental of irrigation water*

State and project	Due		Collected			Uncollected, June 30, 1935
	Fiscal year 1935	To June 30, 1935	Cash		Other credits to June 30, 1935	
			Fiscal year 1935	To June 30, 1935		
Arizona:						
Salt River.....		\$2,246,726.01		\$2,246,726.01		
Yuma auxiliary.....	\$980.06	12,428.45	\$1,225.06	12,428.45		
Arizona-California: Yuma.....	9,482.21	547,644.09	9,727.32	534,418.02	\$12,654.19	\$571.88
California: Orland.....		121,450.85		121,450.85		
Colorado:						
Grand Valley.....	10,913.88	511,930.56	15,362.68	503,195.86	6,500.67	2,234.03
Uncompahgre.....	1,636.21	1,224,769.76	668.32	1,219,042.88		5,726.88
Idaho:						
Boise.....	8,050.00	797,988.57	8,050.00	793,268.07	4,720.50	
Minidoka.....	61,369.49	682,941.93	61,419.49	676,553.92	3,383.01	5.00
Montana:						
Huntley.....	608.58	11,851.42	608.58	11,851.42		
Milk River.....	287.85	237,735.72	287.85	227,388.94	1,208.14	9,138.64
Sun River.....	8.28	132,251.49	113.81	129,649.48	1,366.62	1,235.39
Montana-North Dakota: Lower Yellowstone.....	575.82	136,049.00	318.60	135,663.98		385.02
Nebraska-Wyoming: North Platte.....	838.60	344,943.64	838.60	344,908.39	10.00	25.25
Nevada: Newlands.....		28,291.16		22,114.31	6,176.85	
New Mexico:						
Carlsbad.....	291.76	40,116.59	291.76	40,099.34		17.25
Hondo.....		9,129.70		9,129.70		
New Mexico-Texas: Rio Grande.....	19,215.30	1,478,840.78	13,900.24	1,463,793.72		15,047.06
North Dakota:						
Buford Trenton.....		31.75		31.75		
Williston.....		2,117.28		2,117.28		
Oregon:						
Umatilla.....	121.00	96,277.52	121.00	69,500.72		26,776.80
Vale.....	108.16	22,125.85	1,577.98	21,073.95		1,051.90
Oregon-California: Klamath.....	45,369.28	354,845.22	47,758.13	350,616.01	25.00	4,204.21
Oregon-Idaho: Owyhee.....	4,649.40	4,649.40	4,614.40	4,614.40		35.00
South Dakota: Belle Fourche.....	494.02	9,917.40	265.72	9,671.30	17.80	228.30
Utah: Strawberry Valley.....		17,596.13		17,596.13		
Washington:						
Okanogan.....		110,645.28		108,061.09	2,584.19	
Yakima.....	2,856.74	183,928.12	2,882.54	174,374.42		9,553.70
Wyoming:						
Riverton.....	16,843.42	40,796.33	15,736.33	36,837.02	3,959.31	
Shoshone.....	8,695.67	85,217.57	8,705.31	83,863.49	386.76	967.32
Total.....	102,603.71	9,493,237.57	193,898.02	9,373,040.90	34,293.04	77,203.63

¹ Minidoka-Gooding combined with Minidoka in this report.² Contra.³ Other credits for fiscal year, \$1,221.60.RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1935*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction.....	\$83,086,076.55
103. Other physical properties.....	1,276,027.14
104. Investigations—Colorado River Basin.....	217,659.14
104. Investigations—Parker-Gila project.....	52,191.18
105. Other capital expenditures: Interest during construction.....	6,434,504.93

Total investments (schedule 2)..... \$91,066,458.94

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1935—Continued*

ASSETS AND OTHER DEBITS—Continued

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:	
For advances to Colorado River Dam fund.....	\$14,301,916.60
Colorado River Dam fund.....	83,487.94
N. I. R. A.—Parker-Gila project.....	40,000.00
Collections in transit.....	12,913.40
Total Treasury cash (schedule 1).....	14,438,317.94
122. Special fiscal agents' cash (schedule 1).....	277,033.26
123. Special deposits.....	8,450.78
124. Accounts receivable.....	67,455.37
Total current and accrued assets.....	\$14,791,257.35

VI. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionment accounts.....	* 60,217.27
143. Field cost adjustments.....	100,217.66
145. Jobbing accounts.....	1,824.53
146. Prepayments.....	6,996.31
171. Unadjusted debits.....	44,009.43
Total deferred and unadjusted debits.....	92,830.66
Total assets and other debits.....	105,950,546.95

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205. Long-term liability: U. S. Treasury authorized appropriation.....	126,500,000.00
161. Less: Authorized but not appropriated.....	31,840,000.00
Total long-term liability:	
205.2 Appropriated but not advanced.....	14,301,916.60
205.3 Appropriated and advanced.....	80,358,083.40
205.4 Less: Impounded, Legislative Economy Act.....	* 137,653.66
206. N. I. R. A. allotment—Parker-Gila project.....	100,000.00
Total capital and long-term liability.....	\$94,622,346.34

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:	
211.1. Contractors' earnings—current.....	971,795.81
211.11 Contractors' earnings—holdback.....	2,998,083.81
211.2. Labor.....	34,307.43
211.3. Purchases.....	36,774.08
211.4. Freight and express.....	366,911.10
211.5. Passenger fares.....	1,185.90
211.6. Rights-of-way.....	3,949.00
211.9. Miscellaneous.....	36,159.62
Total audited accounts payable.....	4,449,166.75
214. Matured interest.....	6,408,873.35
Total current and accrued liabilities.....	10,858,040.10

XII. OTHER CREDITS

220. Consumers' meter deposits.....	15.00
223. Special deposits.....	8,450.78
Total other credits.....	8,465.78

XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits.....	5,690.89
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XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested.....	456,003.84
Total liabilities and other credits.....	105,950,546.95

RECLAMATION TABLE 9.—*Appropriations and cash statement, Boulder Canyon project, June 30, 1935*

TREASURY CASH

	Appropriations	N. I. R. A. allotment	Total	N. I. R. A. Parker-Gila project
Appropriations and allotments.....	\$56,660,000.00	\$38,000,000.00	\$94,660,000.00	\$100,000.00
Advances to Colorado River Dam fund.....	46,728,358.70	33,629,724.70	80,358,083.40	-----
Balance not advanced.....	9,931,641.30	4,370,275.30	14,301,916.60	-----
Colorado River Dam fund:				
Advanced from appropriation to fund.....	46,728,358.70	33,629,724.70	80,358,083.40	-----
Collections deposited in fund.....	278,515.64	11,358.83	289,874.47	-----
Total advances and collections.....	47,006,874.34	33,641,083.53	80,647,957.87	-----
Disbursements by General Accounting Office.....	4,974,053.33	25,571.82	4,999,625.15	-----
Advances to fiscal agents.....	41,949,786.68	33,615,058.10	75,564,844.78	60,000.00
Total withdrawals.....	46,923,840.01	33,640,629.92	80,564,469.93	-----
Balance.....	83,034.33	453.61	83,487.94	40,000.00
Repay collections in transit.....		52.44	52.44	-----
Miscellaneous collections in transit.....	12,860.96		12,860.96	-----
Total treasury cash (G. L. 121).....	10,027,536.59	4,370,781.35	14,398,317.94	40,000.00

SPECIAL FISCAL AGENTS' CASH

Advanced to special fiscal agents.....	\$41,949,786.68	\$33,615,058.10	\$75,564,844.78	\$60,000.00
Appropriation transfer adjustments (credit).....	10,431.32	2,481.65	12,912.97	-----
Disbursements by special fiscal agents.....	41,960,218.00	33,353,572.24	75,313,790.24	50,721.02
Fiscal agents' checking balance.....		263,967.51	263,967.51	9,278.98
Collections by fiscal agents.....	295,794.65	16,054.05	311,848.70	-----
Collections deposited by fiscal agents.....	283,737.69	11,411.27	295,148.96	-----
Collections (appropriation transfer adjustments).....	10,431.32	2,481.65	12,912.97	-----
Collections not deposited.....	1,625.64	2,161.13	3,786.77	-----
Special fiscal agents' cash balance (G. L. 122).....	1,625.64	266,128.64	267,754.28	9,278.98

RECLAMATION TABLE 10.—*Financial statement, all-American Canal, June 30, 1935*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction.....	\$2,105,904.31
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II. CURRENT AND ACCRUED ASSETS

121. Treasury cash.....	\$6,578,681.27
Collections in transit.....	11.45
Contributions: Imperial Irrigation District.....	10,000.00
122. Special fiscal agents' cash.....	657,139.35
123. Special deposits.....	12.44
124. Accounts receivable.....	476.91
Total current and accrued assets.....	7,246,321.42

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionment accounts.....	* 6,228.55
146. Prepayments.....	1,231.49
171. Unadjusted debits.....	876.28
Total deferred and unadjusted debits.....	* 4,120.78
Total assets and other debits.....	9,348,104.95

* Contra.

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205.	Long-term liability: U. S. Treasury authorized appropriation.....	\$38,500,000.00	
161.	Less: Authorized but not appropriated.....	29,500,000.00	
	Total long-term liability.....		\$9,000,000.00

XI. CURRENT AND ACCRUED LIABILITIES

211.	Audited accounts payable:		
211.1.	Contractors' earnings—current.....	172,459.60	
211.11.	Contractors' earnings—holdback.....	136,703.53	
211.2.	Labor.....	17,730.75	
211.3.	Purchases.....	4,016.05	
211.4.	Freight and express.....	1,779.77	
211.5.	Passenger fares.....	152.93	
211.6.	Rights-of-way.....	2,263.13	
211.9.	Miscellaneous.....	2,466.17	
	Total current and accrued liabilities.....		337,571.93

XII. OTHER CREDITS

223.	Special deposits.....	12.44	
226.	Contributed funds: Imperial Irrigation District.....	10,000.00	
	Total other credits.....		10,012.44

XIII. DEFERRED AND UNADJUSTED CREDITS

231.	Unadjusted credits.....	66.89	
231.3.	Unadjusted credits: Yuma project.....	*1.00	
	Total deferred and unadjusted credits.....		65.89

XV. APPROPRIATED SURPLUS

251.	Appropriated surplus not specifically invested.....		454.69
	Total liabilities and other credits.....		9,348,104.95

* Contra.

RECLAMATION TABLE 11.—*Appropriations and cash statement, All-American Canal, June 30, 1935*

TREASURY CASH

	Symbol 4-03/5640.21	Symbol 4-05678.21	Total
N. I. R. A. allotments.....	\$6,000,000.00	\$3,000,000.00	\$9,000,000.00
Collections deposited.....	4,320.37		4,320.37
Total allotments and collections.....	6,004,320.37	3,000,000.00	9,004,320.37
Disbursements by General Accounting Office.....	60,639.10		60,639.19
Advances to fiscal agents.....	1,940,000.00	425,000.00	2,365,000.00
Total withdrawals.....	2,000,639.10	425,000.00	2,425,639.10
Balance.....	4,003,681.27	2,575,000.00	6,578,681.27
Repay collections in transit.....	11.45		11.45
Total treasury cash (G. L. 121).....	4,003,692.72	2,575,000.00	6,578,692.72

SPECIAL FISCAL AGENTS' CASH

Advanced to fiscal agents.....	\$1,940,000.00	\$425,000.00	\$2,365,000.00
Disbursements by fiscal agents.....	1,397,475.18	310,662.57	1,708,137.75
Fiscal agents' checking balance.....	542,524.82	114,337.43	656,862.25
Collections by fiscal agents.....	4,505.44	103.48	4,608.92
Collections deposited.....	4,331.82		4,331.82
Collections not deposited.....	173.62	103.48	277.10
Fiscal agents' cash balance (G. L. 122).....	542,698.44	114,440.91	657,139.35

RECLAMATION TABLE 22.—Irrigation and crop results on Government projects, 1934¹

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage ²	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River	245,748	222,092	218,544	\$16,514,901	\$75.60	93,967	52,317	52,317	\$2,407,493	\$46.01
Arizona-California:										
Yuma	65,141	50,094	47,632	2,714,282	57.00	200	168	148	19,107	122.35
Valley division	39,285	41,652	2,226,598	56.19						
Reservation division	7,876	2,818	141,000	50.04						
Bard division	6,004	4,398	137,429	34.75						
Yuma auxiliary (Mesa)	1,976	1,210	209,255	183.43						
California: Orland	20,634	14,028	13,265	446,197	33.64					
Colorado:										
Grand Valley	23,230	16,213	15,188	567,216	37.35	18,400	14,448	14,448	778,779	54.00
Uncompangre	75,654	57,829	57,739	1,266,736	22.00	1,650	1,550	1,490	37,250	25.00
Idaho:										
Boise	166,409	152,120	144,582	3,305,180	22.82	144,068	136,877	132,254	3,035,865	22.95
New York Irrigation District	16,995	15,559	14,974	216,006	14.43					
Nampa-Meridian Irrigation District	37,998	35,965	35,147	741,516	21.10					
Boise-Kuna Irrigation District	47,644	43,799	42,221	827,130	19.60					
Wildier Irrigation District	55,584	49,207	44,844	1,292,390	28.80					
Big Bend Irrigation District	1,714	1,414	1,220	28,816	23.60					
Black Canyon Irrigation District	6,874	6,176	6,176	199,322	32.27					
Minidoka	115,477	93,121	84,654	1,648,814	19.48	719,557	659,581	615,067	19,000,744	28.30
Minidoka Irrigation District	67,540	52,448	49,941	856,233	17.14					
Burley Irrigation District	47,837	40,673	34,713	792,581	22.83					
Montana:										
Bitter Root Irrigation District	17,375	15,527	15,313	375,486	24.52					
Hundley	28,952	23,936	23,936	816,670	34.11					
Milk River	134,557	49,777	49,777	1,176,290	23.81					
Malta division	56,652	19,991	19,991	389,811	19.46					
Glasgow division	22,133	5,804	5,804	80,823	13.93					
Chinook division	55,772	23,982	23,982	704,656	29.39					
Sun River	61,366	36,775	39,675	682,233	17.13					
Fort Shaw division	13,902	7,392	7,445	198,152	17.21					
Greenfields and Big Coulee division	47,464	29,383	32,230	554,081	17.19					
Montana-North Dakota:										
Lower Yellowstone	42,480	36,348	36,348	1,191,102	32.77					
District No. 1	24,081	24,702	24,702	806,435	32.69					
District No. 2	13,999	11,646	11,646	384,636	33.03					

Nebraska-Wyoming:

North Platte.....	234,419	212,415	175,985	4,651,432	26.43	127,630	106,630	101,717	2,353,313	23.14
Pathfinder Irrigation District.....	112,132	98,994	78,360	1,814,842	23.16					
Gering and Fort Laramie Irrigation District.....	54,793	53,700	49,715	1,639,812	32.98					
Goshute Irrigation District.....	51,324	46,594	36,721	1,020,635	27.79					
Northport Irrigation District.....	16,170	13,097	11,189	176,143	15.74					
Nevada: Newlands.....	69,123	41,149	40,056	696,256	17.40					
New Mexico: Carlsbad.....	25,055	24,714	18,714	823,271	44.00					
Rio Grande.....	155,000	129,092	123,822	9,954,272	80.20	77,000	44,173	44,154	1,808,271	40.95
Elephant Butte Irrigation District.....	88,000	72,385	68,792	5,400,707	78.60					
El Paso County Water Improvement District No. 1.....	67,000	56,707	55,030	4,583,565	82.80					
Oregon: Umatilla.....	13,392	11,077	10,730	192,684	17.95	784	654	654	16,935	25.90
East Division.....	7,837	6,841	6,523	119,667	18.35					
West Division.....	5,555	4,236	4,207	73,017	17.35					
Vale.....	15,854	6,413	5,581	140,778	25.22					
Oregon-California:										
Klamath.....	60,545	49,903	49,554	1,898,953	38.30	62,862	35,571	35,498	991,959	27.85
Main division.....	40,405	30,440	30,440	1,037,754	34.10					
Tule Lake division.....	20,140	19,463	19,114	861,199	45.00					
South Dakota: Belle Fourche.....	60,480	42,625	43,405	1,022,446	23.56					
Utah:										
Salt Lake Basin.....	42,056	38,654	34,003	524,003	15.40	89,000	86,500	85,400	2,337,525	27.35
Strawberry Valley.....	18,883	17,333	13,998	141,369	10.10	6,273	5,762	5,537	103,184	18.63
High line division.....	14,148	13,065	12,089	218,816	18.10					
Spanish Fork division.....	9,020	8,256	7,916	163,818	20.70					
Springville-Mapleton division.....										
Washington:										
Okanogan.....	5,750	3,585	3,334	565,330	109.55					
Yakima.....	208,483	167,529	156,470	7,355,319	47.10	166,717	140,581	140,581	7,119,946	50.65
Sunnyside division.....	102,885	86,578	79,954	3,334,685	41.71					
Tieton division.....	29,898	26,100	23,710	2,913,150	122.87					
Kititas division.....	72,000	52,071	50,648	991,533	18.88					
Kennewick.....	4,000	2,780	2,158	145,931	67.62					
Wyoming:										
Riverton.....	32,000	7,532	6,968	110,196	15.81	269	269	269	4,374	16.26
Shoshone.....	67,088	49,576	49,130	988,260	20.10					
Garland division.....	41,649	31,019	30,993	756,420	24.38					
Frannie division.....	13,599	13,406	13,406	157,791	11.77					
Willwood division.....	11,840	5,151	4,731	74,049	15.76					
Total with irrigation.....	1,986,268	1,552,124	1,464,405	59,628,327	40.75	1,508,377	1,285,081	1,229,594	40,014,745	32.55

¹ Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agriculture year" October 1933 to September 1934.

² Area for which service was prepared to supply water in 1934.

RECLAMATION TABLE 22.—*Irrigation and crop results on Government projects, 1934—Continued*

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts		
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage
				Total	Per acre				Total	Per acre
<i>Cropped without irrigation</i>								
Milk River project.....			4,230	\$12,750	\$3.02			
Malta division.....			2,282	8,482	3.72			
Glasgow division.....			1,948	4,268	2.19			
Sun River project: Greenfields and Big Coulee division.....			2,116	24,108	11.39			
Lower Yellowstone project ¹								
Klamath project: Tule Lake leased lands ⁴			56,353	1,293,784	22.42			
Total cropped without irrigation.....			62,699	1,300,642	20.70			
Grand totals, projects.....	1,986,268	1,552,124	1,527,104	60,928,969	39.90			
Warren Act lands.....	1,508,377	1,285,081	1,229,594	40,014,745	32.55			
Grand totals of projects proper and Warren Act.....	3,494,645	2,837,205	2,756,698	100,943,714	36.65			
Grand totals, 1933.....	3,539,709	2,828,787	2,797,815	84,191,733	30.10			

³ Lower Yellowstone: There are no reports for dry-farmed area as the area which was dry farmed during the season of 1934 was a total failure.⁴ Klamath project: Part of area is irrigated from project canals and Tule Lake sump.

RECLAMATION TABLE 23.—*Summary of crop results on reclamation projects in 1934*

NOTE.—These detailed figures are limited to crops covered by census on Government projects proper, excluding all crops in areas served with water under the Warren Act, but including nonirrigated crops grown on the projects]

Crop	Acreage cropped		Yields		Crop value		
	Total	Per- cent of cropped	Total	Average per acre	Average per acre	Total	Percent of total value of all crops
Cereals:			<i>Bushels</i>				
Barley.....	75,592	5.0	2,818,087	37.3	\$23.40	\$1,768,706	2.9
Corn.....	54,078	3.5	1,195,375	22.1	17.07	924,410	1.5
Oats.....	72,386	4.7	2,911,064	40.0	16.50	1,337,652	2.2
Rye.....	3,352	.2	58,863	17.6	12.52	41,940	.1
Wheat.....	144,787	9.6	3,820,945	26.4	19.70	2,849,729	4.7
Total.....	350,195	23.0	10,804,334	30.9	19.85	6,922,437	11.4
Seeds:							
Alfalfa.....	19,300	1.3	73,607	3.8	31.85	615,627	1.0
Clover.....	6,529	.4	28,389	4.3	38.40	250,775	.4
Other.....	2,245	.1	45,661	20.3	62.40	139,919	.2
Total.....	28,074	1.8	147,657	5.3	35.70	1,006,321	1.6
Hay and forage:			<i>Tons</i>				
Alfalfa hay.....	442,086	29.0	1,258,280	2.8	28.50	12,582,874	20.6
Clover hay.....	10,638	.7	14,991	1.4	9.94	100,227	.2
Other hay.....	100,660	6.4	125,308	1.2	16.90	1,695,798	2.8
Corn forage.....	24,298	1.6	68,376	2.8	16.45	399,257	.7
Other forage.....	119,537	7.8	36,856	.3	4.04	481,805	.8
Pasture.....	458,414	30.1	-----	-----	7.17	3,288,967	5.4
Total.....	1,155,633	75.6	1,503,811	1.3	16.05	18,548,928	30.5
Vegetables and truck:			<i>Bushels</i>				
Beans.....	43,828	3.9	637,884	14.6	27.00	1,182,347	1.9
Onions.....	2,282	.1	404,801	177.5	122.70	280,149	.5
Potatoes, white.....	72,103	4.7	11,220,194	155.7	50.70	3,654,135	6.0
Potatoes, sweet.....	1,648	.1	200,634	124.0	99.00	163,215	.3
Truck.....	47,368	3.1	-----	-----	105.20	4,980,046	8.2
Total.....	167,229	10.9	12,463,513	74.6	61.40	10,259,892	16.9
Fruits and nuts:			<i>Pounds</i>				
Apples.....	24,994	1.7	330,486,988	13,240	124.40	3,109,276	5.1
Peaches.....	3,710	.3	22,367,965	6,030	91.50	339,612	.6
Pears.....	8,064	.5	68,914,266	8,560	102.00	821,948	1.3
Prunes.....	2,258	.1	15,797,840	7,000	69.60	156,914	.2
Citrus fruit.....	11,323	.7	68,778,394	6,070	138.20	1,565,007	2.6
Small fruit.....	5,111	.3	22,278,949	4,360	132.70	678,465	1.1
Miscellaneous.....	5,211	.3	11,928,978	2,290	81.20	423,312	.7
Total.....	60,671	3.9	540,553,380	8,920	116.80	7,094,534	11.6
Miscellaneous:			<i>Tons</i>				
Sugar beets.....	87,350	5.8	761,378	8.7	52.40	4,582,366	7.5
Cotton.....	125,521	8.2	138,075	1.1	71.10	8,904,024	14.6
Cottonseed.....	125,521	8.2	61,924	.49	16.78	2,108,421	3.4
Other crops.....	72,667	4.8	-----	-----	20.65	1,502,046	2.5
Total.....	411,059	27.0	-----	-----	41.60	17,096,857	28.0
Grand total, projects.....	2,172,861	-----	-----	-----	-----	-----	-----
Duplication.....	645,757	42.2	-----	-----	-----	-----	-----
Total all crops for which detailed census was taken.....	1,527,104	100.0	-----	-----	39.90	60,928,969	100.0
Total Warren Act crops.....	1,229,594	-----	-----	-----	32.55	40,014,745	-----
Grand total.....	2,756,698	-----	-----	-----	36.65	100,943,714	-----

¹ Bales of 500 pounds each.

RECLAMATION TABLE 24.—Irrigated and cropped acreage and crop values by years, 1906-34

	Federal irrigation projects				Warren Act land				Entire area			
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value	
			For year	Cumulative total			For year	Cumulative total			For year	Cumulative total
1906	22,300	1,20,100	\$244,900	---	---	---	---	---	22,300	1,20,100	\$244,900	---
1907	187,600	1,169,000	4,760,400	\$5,005,300	---	---	---	---	187,600	1,169,000	4,760,400	\$5,005,300
1908	289,500	1,260,500	7,575,800	12,581,100	---	---	---	---	289,500	1,260,500	7,575,800	12,581,100
1909	410,600	1,369,500	11,920,700	24,501,800	---	---	---	---	410,600	1,369,500	11,920,700	24,501,800
1910	465,100	413,000	12,974,600	37,476,400	---	---	---	---	465,100	413,000	12,974,600	37,476,400
1911	541,400	470,100	12,708,600	50,185,000	---	---	---	---	541,400	470,100	12,708,600	50,185,000
1912	588,400	540,000	12,825,400	64,010,400	---	---	---	---	588,400	540,000	12,825,400	64,010,400
1913	699,200	642,200	13,732,200	79,742,600	---	---	---	---	699,200	642,200	13,732,200	79,742,600
1914	701,300	703,400	16,475,500	96,218,100	---	---	---	---	701,300	703,400	16,475,500	96,218,100
1915	814,900	760,000	18,200,000	114,418,100	---	---	---	---	814,900	760,000	18,200,000	114,418,100
1916	923,000	858,300	32,816,000	147,234,100	---	---	---	---	923,000	858,300	32,816,000	147,234,100
1917	1,037,500	966,800	56,462,300	203,696,400	---	---	---	---	1,037,500	966,800	56,462,300	203,696,400
1918	1,141,500	1,051,200	66,821,400	270,517,800	1,501,100	1,481,600	\$35,000,000	---	1,141,500	1,051,200	66,821,400	305,517,800
1919	1,187,300	1,113,500	88,974,100	359,491,900	916,300	880,600	64,000,000	\$69,000,000	2,205,400	1,994,100	152,974,100	458,491,900
1920	1,223,500	1,153,800	66,171,700	425,663,600	981,900	950,900	47,505,800	146,505,800	2,205,400	2,104,700	113,677,500	572,169,400
1921	1,227,500	1,157,900	49,630,300	475,293,900	1,001,300	963,600	44,906,100	191,411,900	2,228,800	2,127,500	94,526,400	666,695,800
1922	1,202,130	1,169,100	50,360,800	525,654,800	983,300	951,300	33,240,800	224,652,700	2,185,430	2,120,400	83,001,700	750,297,500
1923	1,213,700	1,179,870	63,046,300	590,691,100	1,051,400	993,000	37,557,900	262,210,600	2,265,100	2,172,870	102,004,200	852,901,700
1924	1,290,900	1,216,600	66,488,600	657,179,700	930,700	889,500	43,237,500	305,448,100	2,221,600	2,106,100	109,726,100	962,627,800
1925	1,320,300	1,242,800	77,608,900	734,788,600	1,019,200	951,300	53,655,900	359,104,000	2,339,500	2,194,100	131,264,800	1,093,892,600
1926	1,411,000	1,361,500	60,664,900	795,453,500	1,047,200	949,600	49,750,000	408,854,000	2,508,200	2,311,100	110,414,900	1,204,307,500
1927	1,379,000	1,331,600	72,047,200	867,500,700	1,148,100	1,072,500	61,100,000	470,014,000	2,527,100	2,301,100	133,207,200	1,337,514,700
1928	1,442,100	1,489,200	81,077,800	948,578,500	1,234,300	1,192,900	62,495,300	532,509,300	2,677,100	2,681,200	143,573,100	1,481,087,800
1929	1,483,900	1,512,250	88,459,300	1,037,037,800	1,234,230	1,192,900	72,730,400	605,239,700	2,718,130	2,705,240	161,179,880	1,642,267,680
1930	1,504,810	1,550,967	65,007,270	1,102,045,100	1,286,045	1,254,493	54,654,550	659,894,340	2,790,856	2,805,460	119,661,820	1,761,929,500
1931	1,552,718	1,520,354	40,554,037	1,142,599,197	1,283,889	1,251,830	33,406,340	693,290,680	2,846,607	2,772,184	73,960,377	1,835,889,877
1932	1,585,144	1,578,880	31,551,162	1,174,150,359	1,214,461	1,196,400	18,627,219	711,917,869	2,769,605	2,775,280	50,185,381	1,886,081,258
1933	1,589,770	1,598,770	48,765,863	1,222,896,222	1,239,017	1,199,113	35,425,870	747,343,769	2,828,787	2,797,815	84,191,713	1,970,239,991
1934	1,552,124	1,527,104	60,928,969	1,283,825,191	1,285,081	1,229,594	40,014,745	787,358,514	2,837,205	2,756,698	100,943,714	2,071,183,715

1 Estimated.

GENERAL LAND OFFICE

(FRED W. JOHNSON, *Commissioner*)

The area of public land included in original selections, entries, and filings made during the year was 1,759,078 acres, or 1,825,805 acres less than the area included in such entries and filings during the preceding year. The decrease, no doubt, was due to the temporary withdrawals of the public lands from entry and selection made by Executive orders of November 26, 1934, and February 5, 1935.

The area included in final entries, selections, and filings made during the year was 1,771,703 acres, or 546,671 acres more than were included in such entries during the preceding year.

The area which on July 1, 1935, was included in unperfected entries upon which final proof of compliance with the law was not due or had not been presented, in which cases appropriate actions must hereafter be taken was 19,666,693 acres. The area which on said date was included in outstanding licenses, leases, and permits issued under the mineral leasing act was 11,307,677 acres.

The number of letters and reports received for consideration or answer from all sources during the year was 155,505, an increase of 5,784 over such receipts for the preceding year, and 80,771 letters and decisions were written. The latter figure does not include letters prepared for signature in the Department.

There were furnished during the year 47,125 certified and uncertified copies of entry papers, plats, field notes, patents, etc., for which there were received the sum of \$15,050.30. In addition there were furnished for official use by this and other Departments and agencies 43,321 copies of said items.

Proposed reports were submitted on 129 Senate and House bills, and necessary orders and instructions have been prepared or are in course of preparation in connection with 15 bills, public and private, affecting the public lands which were enacted into law.

In cases involving possible suits in courts, 75 reports of field investigation were considered. Suits were recommended in 27 cases, as a result of which \$12,808.35 were recovered, and 1,480 acres restored to the public domain. Forty-eight of the cases were closed without recommendation for suit. Approximately 200 other actions were taken in this class of cases.

The number of attorneys and agents newly admitted to practice before the Department was 11.

There were decided on principles of equity and referred to the board of equitable adjudication and confirmed approximately 920 cases.

GENERAL WITHDRAWAL OF PUBLIC LANDS FROM ENTRY

The vacant, unreserved, and unappropriated public lands in the United States are not now subject to disposition under the non-mineral public land laws, having been temporarily withdrawn from settlement, location, sale, or entry, and reserved for classification. The lands in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming were withdrawn by Executive order of November 26, 1934, pending determination of the most useful purpose to which such lands may be put in consideration of the provisions of the Taylor Grazing Act of June 28, 1934, and for conservation and development of natural resources, and the lands in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, Washington, and Wisconsin were withdrawn by Executive order of February 5, 1935, pending determination of the most useful purpose to which said lands may be put in furtherance of the land program. Executive order of May 20, 1935, amended the said order of November 26, 1934, so as to permit the completion of exchanges authorized by section 8 of the Taylor Grazing Act.

Both of the orders first above mentioned were made subject to valid existing rights.

TAYLOR GRAZING ACT

This office in cooperation with the Division of Grazing has prepared various orders and regulations required in connection with the administration of the Taylor Grazing Act, approved June 28, 1934 (48 Stat. 1269). It has also prepared diagrams of the approved grazing districts. Thousands of inquiries relative to the operation of the law have been received and answered, and approximately 200 applications for exchange, 462 applications for isolated tract sales, and 2,850 applications for leases filed under sections 8, 14, and 15, respectively, of the act have been received and posted on the tract books. There were 668 actions taken on public sale applications, and 26 such applications were approved for patenting.

Orders were prepared involving grazing districts as follows: 1 in Arizona, 5 in Colorado, 1 in Idaho, 4 in Montana, 1 in Nevada,

4 in New Mexico, 4 in Oregon, 8 in Utah, and 1 in Wyoming. In addition there were prepared orders and diagrams for 19 proposed grazing districts, and maps showing the exterior boundaries and appropriate designations of both established and proposed grazing districts.

The estimated areas of the vacant, unappropriated, and unreserved public land in established grazing districts, as of June 30, 1935, are as follows:

State	District totals	State totals
Arizona: No. 1.....	1, 505, 200	1, 505, 200
California:		
No. 1.....	1, 293, 595	
No. 2.....	577, 308	1, 870, 903
Colorado:		
No. 1.....	2, 099, 331	
No. 2.....	438, 673	
No. 3.....	1, 416, 870	
No. 4.....	1, 096, 194	
No. 6.....	1, 408, 252	6, 459, 320
Idaho: No. 1.....	4, 181, 445	4, 181, 445
Montana:		
No. 1.....	1, 624, 235	
No. 2.....	1, 436, 536	
No. 3.....	686, 523	
No. 4.....	144, 887	3, 892, 181
Nevada: No. 1.....	7, 984, 977	7, 984, 977
New Mexico:		
No. 3.....	2, 692, 940	
No. 4.....	2, 437, 649	
No. 5.....	1, 110, 926	
No. 6.....	2, 533, 933	8, 775, 448
Oregon:		
No. 1.....	90, 000	
No. 2.....	4, 960, 676	
No. 3.....	2, 785, 957	
No. 4.....	1, 717, 962	9, 554, 595
Utah:		
No. 1.....	1, 186, 806	
No. 2.....	2, 868, 422	
No. 3.....	3, 424, 472	
No. 4.....	2, 065, 080	
No. 5.....	3, 774, 186	
No. 6.....	3, 749, 431	
No. 7.....	2, 584, 360	
No. 8.....	149, 982	19, 802, 739
Wyoming: No. 1.....	1, 246, 181	1, 246, 181
Total.....		65, 272, 989

WORK UNDER EMERGENCY FUNDS

The work of translating and transcribing the Spanish records in the public survey office at Santa Fe, N. Mex., of land claims in the territory ceded in 1848 to the United States by Mexico, commenced last year as a Federal Civil Works project, was continued through the fiscal year ending June 30, 1935, as a Federal Emergency Relief project. From 6 to 15 translators and transcribers were furnished with employment on this project.

The Civilian Conservation Camp established at Gillette, Wyo., for the purpose of controlling the coal fires in the public lands and privately owned lands in which the coal has been reserved to the Federal Government was continued through the third enrollment period until October 15, 1934, and was reestablished June 5, 1935, for the fifth enrollment period.

The work of surveying the public lands and office work in connection therewith under the Public Works allotments for that purpose continued throughout the fiscal year. The field parties of the General Land Office were also engaged on a large project of cooperative work for the Agricultural Adjustment Administration involving the survey of submarginal lands being purchased by that organization in the Eastern States.

AREAS TO WHICH ACTIVITIES OF THE GENERAL LAND OFFICE EXTEND

Unappropriated and unreserved public lands.—The area of the unappropriated and unreserved public lands as of June 30, 1934, was approximately 165,695,497 acres, not including Alaska, and not including small areas remaining undisposed of in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, and Wisconsin. Of such area, 119,341,782 acres were surveyed and 46,353,697 acres were unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which 2,044,421 acres were surveyed.

In computing the areas which were vacant and unreserved on June 30, 1934, lands in pending, unallowed applications were considered as appropriated; but lands in applications for oil and gas prospecting permits, or in permits granted, or in applications for coal, phosphate, sodium, and/or sulphur, oil shale, or potash permits or leases, or in permits or leases granted, were considered as unappropriated. In view of the fact that the lands affected by the oil-shale order of withdrawal of April 15, 1930, or in designated geological structures of producing oil or gas fields, or in approved oil and gas leases, were then subject to disposition under the stock-raising homestead act, such lands were treated as unappropriated.

Because of the withdrawals made by the Executive orders of November 26, 1934, and February 5, 1935, there were no unreserved public lands at the close of business on June 30, 1935. The area which would have been vacant and unreserved had such withdrawals not been made has not been computed. The areas which were included in entries, selections, filings, etc., during the fiscal year were 1,752,010 acres in the public-land States and 7,068 acres in Alaska, a total of 1,759,078 acres. However, the net area of the public land

was not decreased to that extent as considerable areas were restored to the public domain through the rejection of applications and the cancellation of entries.

Patented with mineral reservations.—There also remained subject to lease or disposal 38,915,684.62 acres of patented lands in which the Government had reserved some or all of the mineral deposits, as shown by the following table:

	Fiscal year	Total reserved
	<i>Acres</i>	<i>Acres</i>
Stock-raising act, all minerals reserved.....	1,049,606.64	26,162,815.51
Other acts:		
All mineral reserved.....	2,075.18	349,836.20
Coal only reserved.....	10,544.10	10,762,649.02
Some named mineral reserved.....	25,228.37	1,700,383.89
Total.....	1,087,454.29	38,915,684.62

Other areas to which activities of the General Land Office extend.—The activities of the General Land Office also extend in various ways to 116,128,603 acres of land included in withdrawals and grazing districts, as shown under the heading "Withdrawals and restorations" and to more than 180,000,000 acres in national forests in the public-land States and in Alaska, which are subject to all mining laws and to possible homestead entry under the act of June 11, 1906 (34 Stat. 233).

The areas under the control of the General Land Office, which on June 30, 1935, were included in mineral leases and permits, or entries, are shown by the following tables:

Mineral leases and permits outstanding on June 30, 1935

	Licenses		Permits		Leases	
	Number	Acres	Number	Acres	Number	Acres
Oil and gas.....			6,441	10,143,163	898	312,536
Coal.....	141	5,617	348	251,947	378	72,749
Potash.....			192	409,407	12	29,465
Sodium.....			44	63,372	1	120
Phosphate.....					8	4,233
Sulphur.....			26	15,068		
Total.....	141	5,617	7,051	10,882,957	1,297	419,103

Areas in pending entries as of June 30, 1935, Alaska not included

State	Acres	State	Acres
Arizona.....	2,143,382	Oregon.....	910,269
California.....	1,516,562	South Dakota.....	417,214
Colorado.....	1,564,964	Utah.....	690,937
Idaho.....	1,130,948	Washington.....	181,137
Montana.....	1,942,300	Wyoming.....	4,119,820
Nevada.....	620,361	General Land Office.....	142,880
New Mexico.....	4,200,315		
North Dakota.....	85,604	Total.....	19,666,693

CADASTRAL ENGINEERING SERVICE

The Cadastral Engineering Service of the General Land Office is the congressionally constituted agency having jurisdiction over the survey and resurvey of the public lands of the United States proper and Alaska, mineral location surveys, and the preparation of the technical and legal records thereof. In addition, as stated under the heading "Work under emergency fund", the General Land Office participated in a program of land surveys for the Agricultural Adjustment Administration of the Department of Agriculture under an allotment of funds by the Federal Emergency Relief Administration, under its land-use program, so that the surveying activities have been more diversified than usual.

During the $2\frac{1}{3}$ months of field activities under the balance of the original Public Works allotment 358,092 man-hours of work were provided and during the $8\frac{1}{2}$ months of preparation of survey returns under the Public Works office allotment, 167,883 man-hours of work were performed on essential projects of permanent value in all parts of the country. The results were satisfactory beyond expectations, both as to the type and value of the work performed and the class and number of people benefited.

Cadastral surveying projects were located in 31 States and the Territory of Alaska, under 149 separate groups, of which total 36 groups in 9 States were resurveys. That part of the work which can be measured on a quantity basis, which excludes investigations and many miscellaneous surveys, embraces 8,274 linear miles, or 1,644,980 acres, comprising 1,040,670 acres of original surveys and 604,310 acres of resurveys. In addition, over 1,000,000 acres of irregular tracts of submarginal lands were surveyed for the Agricultural Adjustment Administration in 10 Eastern States along and adjacent to the Atlantic coast.

Due in part to the expended program under Public Works allotments the technical work of the offices of the Service was the largest in volume for many years. Plats and field notes of surveys and resurveys in 594 townships were prepared and approved, and in addition 239 supplemental plats were constructed and 92 mineral surveys embracing 276 locations were examined and platted at an average cost of \$21.51 per location. In addition to the foregoing, 137 plats of miscellaneous surveys in several States and Alaska were prepared.

There were accepted and placed on file during the year plats representing 4,436,937 acres of original surveys of public lands and 2,903,349 acres of resurveys, comprising an aggregate area of 7,340,286 acres.

The 1934 edition of the large wall map of the United States has been printed and distributed. A new map of the State of Colorado has been issued, and the map of Alaska is in the hands of the contractor for printing. Preliminary work incident to the revision of the map of New Mexico has been commenced.

There were sold to the public 5,107 photolithographic copies of township plats and 15,592 copies were furnished, without cost, to other bureaus and agencies for official use.

RECEIPTS AND EXPENDITURES

Cash receipts.—The total cash receipts from sales, leases, and other disposals of public lands (including receipts from copies of records, sales of Government property, etc.) were \$4,700,135.47, and from sales of Indian lands \$100,026.77, an aggregate of \$4,800,162.24, all of which was deposited in the Treasury; whereas the total expenditure from operations was \$1,142,393, as hereinafter shown, making a net return of \$3,657,769.24.

Receipts under the mineral leasing acts.—Receipts from bonuses, royalties, and rentals under laws providing for the leasing of mineral rights on the public domain (including royalties and rentals from potash deposits and royalties on coal leases in Alaska) aggregated \$4,004,054.54, of which \$3,924,652.44 was received under the act of February 25, 1920 (41 Stat. 437). The largest receipts under this act were from lands in California, the amount being \$1,984,603.95. Wyoming was second, with receipts amounting to \$1,391,220.92. Receipts from other States follow: New Mexico, \$245,545.15; Colorado, \$98,567.63; Montana, \$83,458.73; Utah, \$69,974.08; North Dakota, \$25,188.29; Alabama, \$11,837.95; Louisiana, \$8,898.47; Idaho, \$3,749.33; Nevada, \$640; Washington, \$542.20; and South Dakota, \$425.74. Under the provision of the mineral leasing act cited, each State receives 37½ percent of the receipts thereunder from the public lands within its borders, the reclamation fund receives 52½ percent, and the other 10 percent remains in the Treasury of the United States as miscellaneous receipts.

Distribution of receipts.—Receipts from all sources, aggregating \$4,800,162.24 as above shown, are distributed under the law approximately as follows: Reclamation fund, \$2,304,493.24; to public-land States and certain counties within such States, \$1,802,027.58; general fund, \$593,614.65; and to various Indian tribes, \$100,026.77.

Five percent of the net proceeds from cash sales of public land is paid to the public-land States within which such sales were made and the balance of such receipts from States named in the Reclamation Act are credited to the reclamation fund; the reclamation fund and the States involved receive (on the percentages shown above) 90 percent

of the receipts under the Mineral Leasing Act; receipts from sales of reclamation town sites and camp sites and from royalties and rentals from potash deposits are credited to the reclamation fund; all of the receipts from proceeds of land and timber in the forfeited Oregon and California railroad grant will be paid to certain counties in Oregon in lieu of taxes; 25 percent of the proceeds of land and timber in the forfeited Coos Bay wagon-road grant will be paid to Coos County; the receipts from Indian lands (except 37½ percent of royalties from Red River oil lands, payable to the State of Oklahoma in lieu of taxes) are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows the distribution of these moneys insofar as is possible before final settlement of all accounts by the General Accounting Office:

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation fund	State fund	Total
Sale of public lands.....	\$27,300.12	\$56,659.04	\$3,498.30	\$87,457.46
Fees and commissions.....	61,762.62	136,635.00	-----	198,397.62
Bonuses, rentals, and royalties from mineral leases.....	427,328.40	2,056,782.03	1,469,194.31	3,953,394.74
Proceeds of land and timber in Oregon and California railroad lands.....	-----	-----	323,534.07	323,534.07
Proceeds of land and timber in Coos Bay wagon-road grant.....	17,839.61	-----	5,800.90	23,640.51
Royalties on rentals from potash deposits, act of Oct. 2, 1917.....	-----	45,210.64	-----	45,210.64
Copies of records.....	18,865.38	-----	-----	18,865.38
Power permits.....	15,435.00	-----	-----	15,435.00
Reclamation townsites and camp sites.....	-----	9,116.53	-----	9,116.53
Royalties on coal leases in Alaska.....	5,449.16	-----	-----	5,449.16
Sale of standing timber, Alaska.....	8,611.16	-----	-----	8,611.16
Miscellaneous (rent of land, surveying fees, proceeds of Government property, etc.).....	11,023.20	-----	-----	11,023.20
Total.....	593,614.65	2,304,493.24	1,802,027.58	4,700,135.47
Sale and leases of Indian lands.....	-----	-----	-----	100,026.77
Aggregate.....	-----	-----	-----	4,800,162.24

¹ First and fourth columns contain \$28,742.30 royalties received in Wyoming under act of June 26, 1926.

² Amount payable to Coos County, 25 percent of proceeds of land and timber.

³ Of the amount received as royalties from oil lands in the bed of Red River, Okla., 37½ percent, \$10,464.21, is paid to Oklahoma, and the balance, amounting to \$17,440.30, is credited to the Kiowa, Apache, and Comanche Indians.

Expenditures.—Total expenditures for the conduct of the business of the General Land Office, including expenses of the district land offices (\$221,253), amounted to \$1,142,393. Disbursements from emergency funds or contributed funds for the survey or resurvey of granted lands, public lands, or Indian lands are not included above.

REPAYMENTS

Under the repayment laws, there were stated 102 accounts, allowing repayment of \$16,171.95, and 50 claims were denied. The num-

ber of claims allowed includes six accounts granting repayment of \$3,931.35 received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

HOMESTEADS

In homestead cases, 5,057 entries were approved for patenting. The number of other actions required were as follows: For original homestead entries, 7,084; second homestead entries, 1,286; leaves of absence and extensions of time, 2,320; amendments, 514; appeals, 13,538.

Special agents investigated and reported on 1,850 homestead cases, of which 932 reports were adverse and 918 favorable. Sixty-three hearings were held in Government contests.

Homestead contests, including Government contests, were considered in approximately 1,500 cases, and altogether hearings were had in about 125 cases.

TIMBER AND STONE ENTRIES

Actions were taken on timber and stone sworn statements in 126 cases, and 20 timber and stone entries were approved for patenting.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—During the year 1,104 cases were acted upon. For the same period there were delivered to the lessees 49 leases embracing 25,895.22 acres, granted under section 14 of the Leasing Act; and 1 lease under section 17 of the said act, embracing 38.60 acres.

One lease of 120 acres was sold under section 17 of the act, bringing \$50 per acre, or a total bonus of \$6,000.

The offering of lands comprising the Fort Morgan Military Reservation, Ala., under the provisions of the act of May 23, 1934 (48 Stat. 796), brought a bonus of \$1,234.75, and an oil and gas lease was issued November 1, 1934, comprising 493.9 acres.

Two leases were canceled in entirety and eight leases were canceled in part.

Oil and gas prospecting permits.—April 23, 1935, the Secretary granted a general extension of time on oil and gas permits to August 1, 1935, and on May 4, 1935, instructions were issued to suspend action on all applications for oil and gas prospecting permits then pending, or thereafter filed, pending legislation to amend the Leasing Act.

During the year ended June 30, 1935, 1,523 oil and gas permits were granted. Eight permits were reinstated. There were 269 assignments acted upon, and 2,384 actions were taken on applications for extension of time. Over the same period 271 permits were held for

cancellation and 307 were canceled; 385 applications were rejected in entirety and 516 in part. There were 11,595 other actions taken.

Coal.—During the year there were issued 73 coal-prospecting permits covering 46,397.39 acres, 35 licenses involving 1,372.64 acres, and 28 leases for 3,416.52 acres. The total number of cases disposed of was 2,376.

Potash, sodium, sulphur, and phosphate.—There were no potash permits or leases issued during the year under the act of February 7, 1927 (44 Stat. 1057), action on applications therefor having been withheld pursuant to departmental orders nos. 799, 817, 854, and 914. Eight potash permits were extended, 4 expired by limitation, and 4 were canceled. There were issued 1 sodium lease for 120 acres and 14 sodium prospecting permits involving 23,964.31 acres. Seven sodium permits expired by limitation, 1 sodium lease and 1 sodium permit were canceled. There were four sulphur permits issued during the year, involving 2,211.26 acres. There were 430 cases disposed of during the year involving the above minerals.

There was a total of 155 leases, licenses, and permits for coal, sodium, etc., issued during the year, involving 77,482.12 acres.

Royalties and rentals.—Receipts for the year under the Mineral Leasing Act of February 25, 1920, were from oil and gas, \$3,596,598.95; from coal, \$273,723.23; from potash, \$48,981.90; from phosphate, \$4,391.88; and from sodium, \$956.48, making the total receipts \$3,924,652.44.

Mineral entries.—There were approved for patent 102 entries.

Mineral applications.—There were 226 mineral applications disposed of during the year.

Mineral contests.—Exclusive of oil-shale, Boulder Dam and Reservoir project, and the San Gabriel Canyon claims, there were 249 mineral contests disposed of during the year.

Miscellaneous mineral cases.—There were 569 miscellaneous mineral cases disposed of during the year.

Oil-shale claims under patent proceedings.—Five mineral entries for 28 claims were approved for patent during the year.

Proceedings against mining locations.—Final action has been taken on all the reports, except two, submitted on mining claims in conflict with the right-of-way for reservoir purposes in the San Gabriel Canyon, and all cases except one contest have been disposed of in the Boulder Dam and Reservoir project. In the Metropolitan Water District appropriate action was taken on 560 field reports.

RIGHTS-OF-WAY

Six railroad right-of-way applications were approved during the year and 53 stock-watering reservoir applications were disposed of.

In addition, in other cases, 395 right-of-way applications were approved and 48 canceled. One thousand seven hundred and forty-two other actions were taken.

FEDERAL RECLAMATION PROJECTS

There are 35 Federal reclamation projects in 14 Western States, 21 of which are operated in whole or in part by irrigation districts and water users' associations. There are, in addition, five Indian reclamation projects, the irrigation features of which are under the supervision of the Bureau of Indian Affairs.

During the year 280 original reclamation homestead entries and 227 assignments of such entries were received, and 288 reclamation entries were approved for patenting.

PRIVATE IRRIGATION PROJECTS

Five private irrigation companies were approved during the year as dependable sources of water supply for desert-land entries.

DESERT LAND ACT

During the year 90 entries were approved for patenting under the desert land act.

CAREY ACT

Carey Act withdrawals and segregations amounting to 35,040.09 acres were considered on which either final or interlocutory action was taken.

PITTMAN ACT

During the year 69 applications were received under the Pittman Acts of October 22, 1919 (41 Stat. 293), and September 22, 1922 (42 Stat. 1012). Action has been taken in all but 23 cases.

SWAMP AND OVERFLOWED LANDS

During the year, under the swamp-land acts, there were approved and patented to the States 2,564.39 acres, and claims for 151,128.87 acres were finally rejected. New claims were asserted during the year to 244,198.45 acres.

STATE GRANTS AND SELECTIONS

New indemnity selections embracing 715,356.23 acres were received during the year, and selections amounting to 219,526.67 acres were approved and title conveyed to the States. Selections involv-

ing 13,903.84 acres were canceled. New quantity grant selections embracing 3,774.41 acres were approved and certified to the States and there were canceled selections involving 49,894.45 acres.

Exchange selections embracing 14,036.88 acres in lieu of Arizona State lands were approved and certified under the act of May 23, 1930 (46 Stat. 378), as amended by the act of February 21, 1931 (46 Stat. 1204).

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections received, together with those on hand, amounted to 124,562.38 acres; 11,723.38 acres were certified or patented in lieu of such grants; and 50,000 acres of selections were rejected.

REVESTED OREGON AND CALIFORNIA RAILROAD AND RECONVEYED COOS BAY WAGON ROAD GRANT LANDS

Transactions concerning revested Oregon & California Railroad and Coos Bay Wagon Road grant lands for the fiscal year follow:

Restored to entry, etc.—Revested Oregon & California Railroad grant lands comprising 6,549.75 acres were restored to homestead entry, and 689.65 acres were reclassified as timber land.

Forty acres of the reconveyed Coos Bay Wagon Road grant lands were reclassified as timber land.

Timber sales.—Fifty-seven sales of timber on the revested Oregon & California Railroad grant lands were made during the past year, involving 4,591.20 acres of land, containing 174,539,000 feet board measure of timber, for which the sum of \$276,161.56 was received. Total sales to June 30, 1935, 971, involving 120,437.60 acres, containing 2,808,963,980 feet board measure of timber for which a total of \$6,623,207.08 have been received.

Two sales of timber on the reconveyed Coos Bay Wagon Road grant lands were made during the past year, involving 80 acres of land, containing 2,355,000 feet board measure of timber, for which the sum of \$4,142.50 was received. Total sales to June 30, 1935, 103, involving 17,620.78 acres, containing 701,532,000 feet board measure of timber, for which a total of \$1,623,164.84 has been received.

Extension of time.—Under the provisions of the act of May 19, 1930 (46 Stat. 369), authorizing the Secretary to extend the time for cutting and removing timber from said revested and reconveyed lands in Oregon, 16 extensions have been granted, involving 3,780.55 acres. Two applications were finally denied.

COLOR OF TITLE CLAIMS

There are a number of acts under which applications were filed during the year for color of title claims. Most applications received were filed under the act of December 22, 1928 (45 Stat. 1069), under which 30 patents were issued for a total of 857.27 acres, for which the sum of \$4,913.77 was received. Two hundred and eighty-five other actions were taken in color of title cases under other acts.

EXCHANGES

Various acts of Congress provide for exchanges of lands in private ownership for public lands of the United States. During the year title was accepted to 165,452.30 acres, under the act of March 20, 1922 (42 Stat. 465), in aid of consolidation of national forests, and title to 18,419.32 acres was accepted under the act of May 14, 1930 (46 Stat. 278), in connection with the Petrified Forest National Monument in Arizona. Title was accepted to 440 acres under the act of April 21, 1904 (23 Stat. 211), and to 2,159.2 acres under the act of May 23, 1930 (46 Stat. 378). Forest lieu selections under the act of June 4, 1897 (30 Stat. 36), were considered in 99 cases, with 5 patents issuing. An application involving privately owned lands in the Chaco Canyon National Monument was also considered.

CHANGE OF ENTRY

Twenty-four actions were taken and one patent issued on applications for change of entry under the act of January 27, 1922 (42 Stat. 359).

CHIPPEWA LOGGING

Extensions of time were granted on 2 contracts involving timber on the former Nett Lake Indian Reservation, Minn., and 1 contract involving timber on the former Red Lake Reservation was canceled in aid of a plan by the Office of Indian Affairs for a land program for certain Indians in Minnesota.

INDIAN ALLOTMENTS

There were 553 cases of fee and trust allotment applications considered under the act of February 8, 1887 (24 Stat. 388), and 180 trust patents and 257 patents in fee were issued.

INDIAN PUEBLO LANDS

Consideration was given during the year to 1,621 non-Indian claims filed under the act of June 7, 1924 (43 Stat. 636), 893 of which were patented.

HOMESTEADS OF CEDED INDIAN LANDS

The number of actions taken involving homestead entries of ceded Indian lands was 3,486, with 140 patents issuing. Many of the actions related to payments.

LEASES OTHER THAN MINERAL LEASES

During the year 4 leases for aviation purposes, containing a total of 2,127.03 acres, were issued and 2 such leases, containing 1,280 acres, were canceled. One hundred and sixteen actions were taken in other cases. One lease for grazing purposes, involving 9,000 acres in Alaska, was canceled.

TEXAS-NEW MEXICO BOUNDARY

After years of uncertainty as to the exact location of a portion of the boundary between Texas and New Mexico, resulting from the shifting of the course of the Rio Grande River, the boundary in dispute was fixed by decree of the Supreme Court of the United States (276 U. S. 558). The act of June 16, 1934 (48 Stat. 975), provides a means by which the Texas title claimants to lands in New Mexico may obtain title from the United States. A great deal of correspondence relative to these claims has been received and answered during the year.

TRESPASS CASES

The amount received during the year in settlement for coal trespass was \$6,042.48; for timber trespass, \$11,985.70; and for grazing trespass, \$152.10. Altogether there were 929 actions taken in trespass cases.

RECREATIONAL AREAS

Nine applications by States, counties, or towns were considered for park projects under the Recreational Act of June 14, 1924 (44 Stat. 741).

MISCELLANEOUS CASES CONSIDERED

The following statement shows the number of actions taken, and patents issued, in each of the cases indicated: Entries and sales of abandoned military reservation lands, 82 action, 10 patents; cash and credit entries, 70 actions, 21 patents; applications and entries subject to Arkansas drainage laws, 246 actions, 4 patents; sales of ceded Indian lands, 53 actions, 14 patents; homestead entries by Indians, 13 actions, 1 patent; military bounty-land warrants, 42 actions, 3

patents; cemetery applications, 4 actions; park applications, 5 actions, 4 patents; preemption claims, 44 actions, 2 patents; private and claims, 131 actions, 10 patents; scrip, 41 actions, 9 patents; soldiers' additional entries, 285 actions, 44 patents; town-lot entries, 364 actions, 168 patents; town-site entries, 15 actions, 2 patents; trade and manufacturing site applications, Alaska, 15 actions, 1 patent; 5-acre tracts, Alaska, 6 actions.

WITHDRAWALS AND RESTORATIONS

One new stock driveway was established and 10 existing driveways modified; additions to wildlife refuges amounted to nearly 5,000 acres; and 2 withdrawals aggregating 23,350 acres were made for national-forest classification. A total of approximately 658 orders of withdrawal, or restoration of lands from withdrawal were prepared or received and noted on the tract books.

The tables which follow give the estimated total areas in outstanding withdrawals and classifications as of June 30, 1935, other than the general withdrawals made by Executive orders of November 26, 1934, and February 5, 1935:

Withdrawals other than mineral withdrawals and classifications

	<i>Total area withdrawn June 30, 1935</i>		<i>Total area withdrawn June 30, 1935</i>
Stock driveways-----	9,761,196	Oregon-California and Coos	
Recreational area with-		Bay unrestored timber land_	1,245,832
drawals-----	284,604	For forest exchange with New	
Air-navigation sites-----	33,007	Mexico-----	681,000
Carey Act withdrawals-----	35,824	For game and bird refuges---	162,705
Carey Act segregations-----	219,511	For national-forest purposes--	157,903
Reclamation withdrawals----	21,919,957	For national parks and monu-	
San Carlos irrigation project		ments-----	3,943,413
(Indian)-----	136,860	For New Mexico-Arizona In-	
Fort Hall irrigation project		dian consolidation-----	1,134,972
(Indian)-----	114,720	For agricultural experiment	
Fort Peck irrigation project,		stations-----	309,734
Montana-----	204,720	For flood and erosion control_	10,750
Booneville Dam, Oregon-Wash-		For State game refuge classi-	
ington-----	79,080	fication-----	44,000
Water-power reserves (non-		For recreational classification_	43,793
Indian)-----	5,223,178	For irrigation-power classifica-	
Reservoir and well sites-----	254,130	tion-----	30,880
Public water reserves-----	492,848	For archeological classifica-	
Los Angeles water supply ¹ ---	866,365	tion-----	11,297
Mizpah-Pumpkin Creek graz-		Cooperative lookout stations--	727
ing district-----	25,124	For miscellaneous purposes---	1,644
Grazing withdrawals (not in-			
cluding withdrawals under		Total-----	116,128,603
Taylor Grazing Act-----	3,425,840		
Grazing districts under Taylor			
Grazing Act-----	65,272,989		

¹ Includes Owens River-Mono Basin grazing district.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

A summary of the outstanding mineral withdrawals and classifications as of June 30, 1935, is as follows:

	Withdrawn	Classified
	<i>Acres</i>	<i>Acres</i>
Coal.....	26,976,775	33,276,103
Oil.....	5,168,593	71,884
Oil shale.....	5,989,949	4,081,208
Phosphate.....	1,889,601	302,219
Potash.....	9,414,466	-----
Total.....	49,439,384	37,731,414

The area of the withdrawn oil land, shown above, includes 13,578 acres withdrawn as a helium reserve. The figures given include much land which has been patented with or without a reservation of minerals. The areas so patented have not been computed. However, some or all minerals have been reserved in patents aggregating 38,915,684.62 acres issued under the stockraising and other laws, for lands not withdrawn or classified as valuable for minerals, as well as for lands so withdrawn or classified.

TABLES

The following tables show the facts as to entries made, patents issued, etc., during the fiscal year:

Original entries, fiscal year of 1935

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock-raising.....	2,098	1,036,847	35	15,023
Enlarged.....	142	32,613	1	240
Reclamation.....	83	8,993	75	8,258
Forest.....	16	1,329	1	60
Sec. 2289, et al.....	958	86,169	49	3,780
Total homesteads.....	3,297	1,165,951	161	27,361
Deserts.....	47	5,032	1	50
State selections.....	160	228,898	-----	-----
Railroad selections.....	4	758	-----	-----
Applications and filings.....	147	-----	7	-----
Miscellaneous.....	86	331,028	1	-----
Total.....	3,741	1,731,667	170	27,411
Indian land as above.....	170	27,411	-----	-----
Grand total.....	3,911	1,759,078	-----	-----

Final entries, fiscal year of 1935

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	3,326	1,416,623	135	61,263
Enlarged.....	398	101,132	82	17,300
Reclamation.....	191	18,715	30	2,789
Forest.....	46	4,087	1	160
Commuted.....	23	1,738	31	2,700
Sec. 2289 et al.....	941	99,839	48	5,343
Total homesteads.....	4,925	1,642,134	327	89,555
Deserts.....	75	9,205	2	360
Public auction.....	21	1,895	1	120
Timber and stone.....	20	1,822		
Mineral.....	94	7,413	1	16
Miscellaneous.....	1,660	17,253	86	1,930
Total.....	6,795	1,679,722	417	91,981
Indian land as above.....	417	91,981		
Grand total.....	7,212	1,771,703		

Patents and certificates, fiscal year of 1935

	Number	Acres
Homesteads:		
Stock raising.....	2,179	1,049,131
Enlarged.....	433	109,207
Reclamation.....	293	27,463
Forest.....	56	5,314
Sec. 2289 et al.....	912	97,889
Total homesteads.....	3,873	1,289,004
Deserts.....	344	33,116
Public auction.....	56	5,253
Timber and stone.....	20	1,539
Mineral.....	102	10,523
Railroad.....	21	12,762
Miscellaneous.....	1,686	41,933
Total patents.....	6,102	1,394,130
Certified to States.....		223,301
Grand total.....		1,617,431

Homestead entries, fiscal year of 1935, includes Indian lands

State	Original		Final		State	Original		Final	
	Number	Acres	Number	Acres		Number	Acres	Number	Acres
Alaska.....	61	7,068	32	2,510	Oregon.....	261	53,752	222	46,510
Arizona.....	157	48,746	521	177,121	South Dakota.....	116	42,592	157	41,169
California.....	249	54,484	461	97,185	Utah.....	71	30,178	104	44,143
Colorado.....	256	88,991	530	185,657	Washington.....	70	9,400	32	5,792
Idaho.....	132	54,036	158	57,908	Wyoming.....	769	346,389	944	381,865
Montana.....	267	109,821	648	172,364	General Land Office ¹	294	20,434	244	22,368
Nevada.....	11	2,043	28	7,417	Total.....	3,458	1,193,312	5,252	1,731,689
New Mexico.....	691	313,068	1,137	484,200					
North Dakota.....	53	12,310	34	5,480					

¹ Entries made in General Land Office for land in States without district land offices. The original entries were 35 in Alabama, 1,856 acres; 135 in Arkansas, 9,666 acres; 12 in Florida, 762 acres; 1 in Indiana, 2 acres; 1 in Kansas, 389 acres; 9 in Louisiana, 537 acres; 6 in Michigan, 331 acres; 43 in Minnesota, 2,391 acres; 9 in Mississippi, 453 acres; 13 in Nebraska, 1,816 acres; 29 in Oklahoma, 2,191 acres; and 1 in Wisconsin, 40 acres.

The above 3,458 original entries include in addition to the three main homestead acts, 17 forest, 1,389 acres; 158 reclamation, 17,251 acres, and 5 Kinkaid homesteads, 599 acres. The final entries likewise include 47 forest, 4,247 acres; 221 reclamation, 21,504 acres; 8 Kinkaid, 1,528 acres, and 16 soldiers' additional homesteads, 449 acres. The finals include 55 commuted entries, 4,438 acres.

Desert-land entries, fiscal year of 1935, includes Indian lands

State	Original		Final		State	Original		Final	
	Num-ber	Acres	Num-ber	Acres		Num-ber	Acres	Num-ber	Acres
Arizona.....	9	636	8	1,153	Oregon.....	8	1,012	5	339
California.....	7	967	8	680	South Dakota.....	1	80	1	80
Colorado.....	1	50	2	360	Utah.....	1	162	3	283
Idaho.....	10	761	15	1,361	Washington.....	1	37	7	1,540
Montana.....	1	320	27	3,613	Wyoming.....	5	569		
Nevada.....	3	328			Total.....	48	5,082	77	9,560
New Mexico.....	2	240	1	160					

The above final entries include under relief act of Feb. 14, 1934, 5 entries, 880 acres.

Other entries, fiscal year of 1935, Indian land included

State	Public auction		Timber and stone		Mineral		Miscellaneous			
	Num-ber	Acres	Num-ber	Acres	Num-ber	Acres	Original		Final	
							Num-ber	Acres	Num-ber	Acres
Alaska.....					16	819	12		14	14
Arizona.....	1	160			6	1,071	18	1,330,768	15	1,750
California.....	1	40			19	1,319	32	120	97	1,140
Colorado.....	2	80	2	139	9	647	4			
Idaho.....	2	87			10	783	2		10	30
Montana.....	2	320	1	160	9	833	4	48	36	400
Nevada.....	1	80			4	136			1	
New Mexico.....	1	184			7	252			1,411	10,980
Oregon.....	3	82	1	160					60	1,180
South Dakota.....									25	1,630
Utah.....	1	160	1	40	13	1,033	1		1	80
Washington.....	2	177	3	360	1	216	3		24	
Wyoming.....	3	400	5	560	1	320	17	10	16	10
General Land Office.....	2	125	8	462			2	79	34	1,940
Total.....	21	1,895	21	1,881	95	7,429	95	331,025	1,744	19,190

¹ Includes 2 exchange selections, 324,303 acres, act June 14, 1934.

² Includes 1,403 private claims, 10,826 acres.

Class, number, and area of patents issued during fiscal year ended June 30, 1935

Class	Number	Acres	Class	Number	Acres
Choctaw scrip.....	3	477	Railroad lieu.....	2	40
Commuted homestead.....	29	2,411	Reclamation homestead.....	293	27,463
Desert land.....	51	5,653	Reclamation desert land.....	20	2,480
Forest exchange.....	21	3,158	Reissue.....	323	(³)
Forest homestead.....	56	5,314	Sioux half-breed scrip.....	4	397
Forest lieu.....	6	400	Small holding claim.....	4	239
Homestead, final.....	1,848	94,256	Soldiers' additional.....	34	746
Homestead, enlarged.....	433	109,207	Special acts.....	966	49,567
Homestead, stock-raising.....	2,179	1,049,131	Supplemental act Apr. 14, 1914.....	3	440
Indian fee.....	257	(²)	Swamp.....	13	2,564
Indian homestead, act July 4, 1884.....	1	476	Timber and stone.....	20	1,539
Indian trust.....	8	256	Timber sales.....	62	(⁴)
Military bounty-land warrants.....	5	452	To complete records.....	67	(⁵)
Mineral.....	102	10,523	Town lots.....	167	78
Miscellaneous.....	32	2,434	Townsite.....	1	83
Public sale.....	56	5,253	Valentine scrip.....	2	4
Private land claim.....	15	6,367			
Railroad.....	19	12,722	Total.....	6,102	1,394,130

¹ Includes 3 Kinkaid Act patents, 502 acres.

² 41,003 acres.

³ 42,583 acres.

⁴ 4,810 acres.

⁵ No area to be reported.

Area patented with coal reserved, 10,544 acres; with oil, gas, phosphate, etc., reserved, 25,228 acres; with all minerals reserved, all of stock-raising homesteads and 2,075 acres under other acts.

The "special acts" above include 3,021 acres of exchanges to consolidate Indian reservations and allotments, and 10,081 acres for quieting titles in Indian pueblos, all in New Mexico; and 27,611 acres of exchanges for consolidating a national monument in Arizona.

Applications filed under Mineral Leasing Act of Feb. 25, 1920, fiscal year of 1935, with totals to June 30, 1935

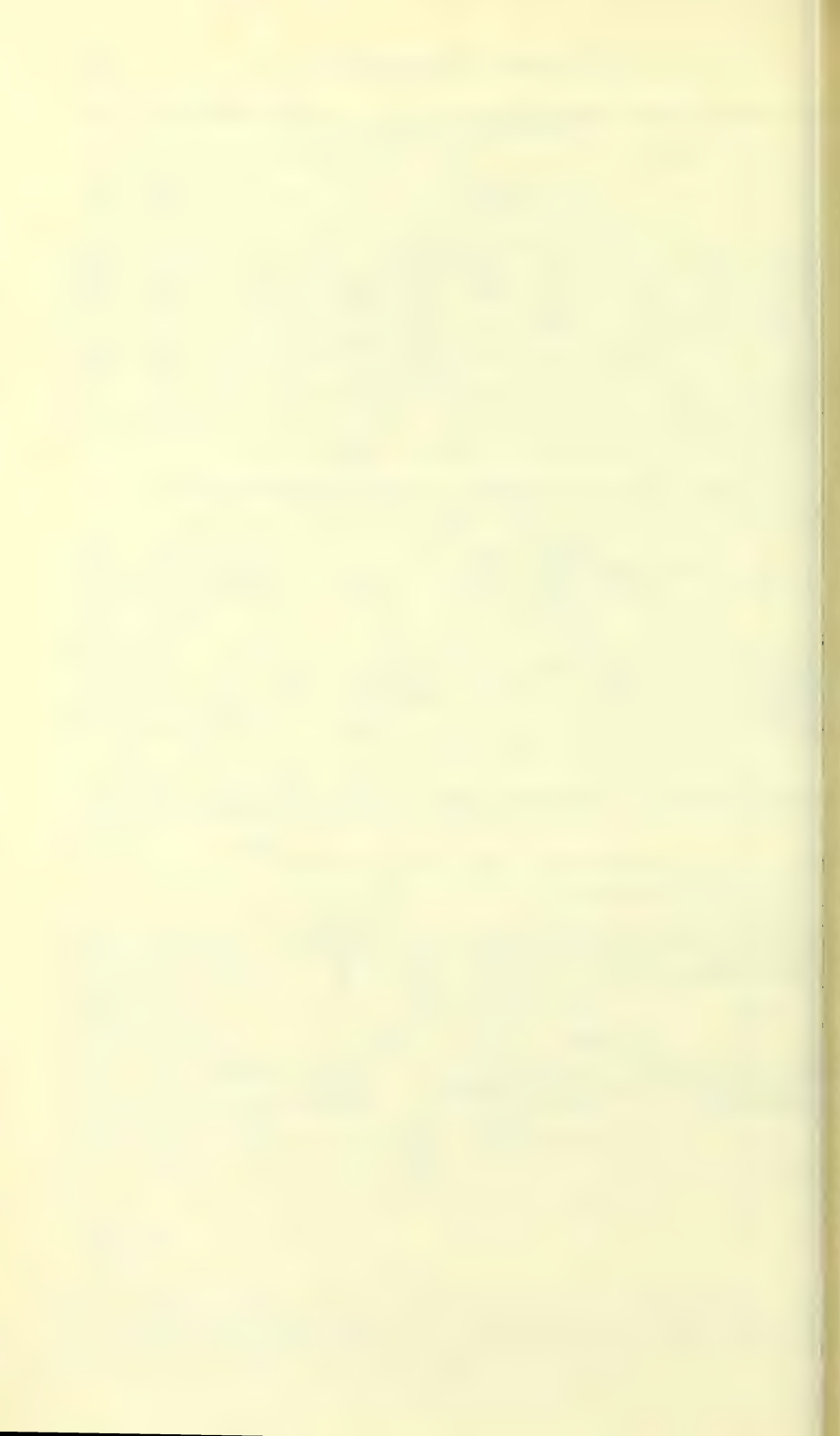
	Filed in 1935	Total to June 30, 1935		Filed in 1935	Total to June 30, 1935
Alabama.....		16	Nebraska.....		36
Alaska.....	24	1,753	Nevada.....	17	1,762
Arizona.....	16	1,914	New Mexico.....	486	11,595
Arkansas.....		24	North Dakota.....	12	486
California.....	388	22,033	Oklahoma.....		557
Colorado.....	189	9,155	Oregon.....	30	430
Florida.....		1	South Dakota.....	8	379
Idaho.....	23	1,076	Utah.....	419	13,441
Kansas.....		5	Washington.....	17	288
Louisiana.....		262	Wyoming.....	389	17,769
Michigan.....		3	General Land Office.....	87	196
Mississippi.....		15			
Montana.....	169	13,194	Total.....	2,274	96,390

State grants—Areas patented or certified in fiscal year 1935

State	Swamp land patents	School section indem- nity certifi- cations	Quan- tity grant certifi- cations	State	Swamp land patents	School section indem- nity certifi- cations	Quan- tity grant certifi- cations
Arizona.....		208,199	3,774	Montana.....		3,097	
California.....	313	342		New Mexico.....		7,810	
Florida.....	186			Oregon.....	454	79	
Louisiana.....	64			Wisconsin.....	1,453		
Minnesota.....	54			Total.....	2,564	219,527	3,774
Missouri.....	40						

Railroad grants—Land approved in fiscal year 1935 for patent or certification

	State	Acres
TO CORPORATIONS		
Atlantic & Pacific (now Santa Fe Pacific).....	Arizona.....	40
Do.....	New Mexico.....	1,520
Central Pacific (California and Oregon).....	California.....	201
Central Pacific.....	do.....	2,609
Southern Pacific (branch line).....	do.....	6,134
Total.....		10,504
TO STATES		
Choctaw, Oklahoma and Gulf.....	Arkansas.....	414
Missouri Pacific.....	do.....	696
St. Paul, Minneapolis & Manitoba (Great Northern).....	Minnesota.....	29
Wisconsin Central.....	Wisconsin.....	80
Total.....		1,219



OFFICE OF INDIAN AFFAIRS

(JOHN COLLIER, Commissioner)

FOREWORD

This annual report is burdened with overcondensed statements of things done and more things yet to do; with urgencies, programs, and life-and-death necessities, all under the compulsion of speed.

It is all true. But the foundations of Indian life rest in a quiet earth. Indian life is not tense, is not haunted with urgencies, and does not fully accept the view that programs must be achieved, lest otherwise ruin shall swiftly befall.

Indian life is happy. Even the most poverty-stricken and seemingly futureless Indians still are happy. Indians have known how to be happy amid hardships and dangers through many thousand years. They do not expect much, often they expect nothing at all; yet they are able to be happy. Possibly this is the most interesting and important fact about Indians.

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A brief outline of the report is included for convenience in use:

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THE ACCELERATED TASK

The Indians and the Indian Service have had a difficult and challenging year, due to drought and depression; on the other hand, many Indians, and Indian property, have benefited from the gen-

erous relief appropriations. The effort to spend these relief funds wisely has meant extra work for the Service staff, which already had assumed the additional burden of launching the Indian reorganization program without benefit of new funds or personnel.

REORGANIZING INDIAN LIFE

The Indian Reorganization (modified Wheeler-Howard) Act was approved June 18, 1934. Its passage made mandatory a complete change in the traditional Federal Indian policy of individual allotment of land—which resulted in the break-up of Indian reservations—and of destroying Indian organization, institutions, and racial heritage to the end that the Indian as an Indian might disappear from the American scene with the utmost speed.

The net result of this policy has been the loss of two-thirds of the 139,000,000 acres owned by Indian tribes in 1887, the year when the General Allotment Act was adopted; and the individualization policy has broken up the land remaining on allotted reservations, has disrupted tribal bonds, has destroyed old incentives to action and has created a race of petty landlords who in the generous Indian manner have shared their constantly shrinking income with the ever-increasing number of their landless relatives and friends.

The Indian Reorganization Act prohibits future allotments, and the sale of Indian lands except to the tribes; it restores to the tribes the unentered remnants of the so-called surplus lands of the allotted reservations thrown open to white settlement; it authorizes annual appropriations for the purchase of land for landless Indians; provides for the consolidation of Indian lands, and sets up a process which enables Indians voluntarily to return their individual landholdings to the protection of tribal status, thus reversing the disintegration policy.

The act also authorizes a ten-million-dollar revolving loan fund, the use of which is restricted to those tribes which organize and incorporate so as to create community responsibility. It is expected that the organization of Indians in well-knit, functional groups and communities will help materially in the creation of new incentives for individual and collective action. The Indian is not a "rugged individualist"; he functions best as an integrated member of a group, clan, or tribe. Identification of his individuality with clan or tribe is with him a spiritual necessity. If the satisfaction of this compelling sentiment is denied him—as it was for half a century or more—the Indian does not, it has been clearly shown, merge into white group life. Through a modernized form of Indian organization, adapted to the needs of the various tribes (a

form of organization now authorized by law), it is possible to make use of this powerful latent civic force.

The Indian Reorganization Act was passed a few days before the end of the Seventy-third Congress. None of the authorized appropriations, however, became available until May 1935. For land purchases the authorized appropriation was reduced to one-half, or \$1,000,000; the revolving credit fund was limited to a quarter of the authorization, or \$2,500,000; for organizing expenses the amount was reduced from \$250,000 to \$175,000.

THE INDIANS HOLD THEIR FIRST ELECTIONS

Congress had ordained in section 18 that each tribe must be given the unusual privilege of deciding at a special election whether it wanted to accept these benefits or reject them. Beginning with August 1934 and ending June 17, 1935, a series of 263 elections resulted in the decision by 73 tribes, with a population of 63,467 persons, to exclude themselves from the benefits and protection of the act, and by 172 tribes, with the population of 132,426 persons, to accept the act.

The participation of the Indians in these referendum elections was astonishingly heavy. In national elections, when a President is chosen and the interest of the voters is aroused through a long, intensive campaign, the average number of ballots cast does not exceed 52 percent of the total number of eligible voters; in referendum elections deciding on such matters as constitutional ratifications, bond issues, etc., when no personalities are injected into the campaign, less than 35 percent of the eligible voters participate. The referendum election on the Indian Reorganization Act did not concern itself with candidates and personalities, yet 62 percent of all adult Indians came to the polls and cast their ballots.

This heavy participation becomes even more significant when it is remembered that at least half the Indian voters could not speak the English language, that reading and writing were unknown to many of them, and that most of them had never voted before. Yet so great was their interest that grandmothers and grandfathers past the allotted span of three score and ten walked many miles to the polling places, there to mark and cast their ballots with celerity and dispatch even though some of them had to be instructed which end of the pencil to use.

Except in a single tribe (Isleta Pueblo), not an Indian voice was raised against the participation of women; everywhere the right of the feminine element to take part in the referendums was conceded without question.

The rejection of the Reorganization Act on 73 reservations, most of them very small (but including the largest reservation, that of the Navajos), was due in the main to energetic campaigns of misrepresentation carried on by special interests which feared that they would lose positions of advantage through the applications of the act. Joining hands in this campaign of misrepresentation were stockmen who feared that the Indians would run their own stock on land hitherto leased to white interests; traders who were afraid of losing their business through the competition of Indian consumers' cooperatives; merchants and politicians in white communities on the edge of reservations; a few missionaries who resented the extension of the constitutional guarantee of religious liberty and freedom of conscience to Indians (not an element in the Reorganization Act, but enforced as a policy by the present administration); lumber interests which did not want to see Indian tribes exploit their own forest resources. These interests, working frequently by the historic method of defrauding Indian tribes with the connivance of certain of their own leaders, spread extreme and bizarre falsehoods concerning the effects of the act.

Among the myths spread by adverse interests on various reservations were such as these: Acceptance of the act would cause Indian owners of allotments to lose their land, which would then be distributed among those Indians who had disposed of their allotments; all farm crops would be impounded in warehouses and thereafter would be equally distributed among the population; the Indians would be segregated behind wire fences charged with electricity; all the livestock would be taken from certain tribes; unallotted reservations would be thrown open to white entry; Indian dances and other religious ceremonies would be suppressed; Indians would not be allowed to go to Christian churches; certain Southwestern reservations would be turned over to Mexico, etc.

THE NAVAJO VOTE

On the Navajo Reservation, certain interests disseminated the most fantastic fictions in their effort to induce the 43,500 Navajos to reject the help the Federal Government was offering them. With the aid of these fictions, and by falsely connecting the referendum on the Reorganization Act with the unpopular but necessary stock reduction program, the propagandists succeeded in bringing about the exclusion of the Navajo Reservation by a very narrow margin of votes: 7,608 for acceptance; 7,992 against acceptance. Immediately after the result became known, Navajo leaders started a movement to reverse it through a renewed referendum, which will be possible only through a new enabling act of Congress.

THE INDIAN RENAISSANCE

Considering the long history of broken treaties, pledges, and promises, the fact that 172 tribes with an Indian population of 132,000 accepted the word of the Government that the fundamental reorganization of their lives would not harm them is evidence of a new, more satisfactory relationship between the Indians and the Indian Service. The referendum elections served a most valuable purpose. They were palpable proof to the Indians that the Government really was ready to give them a voice in the management of their own affairs, and that the period of arbitrary autocratic rule over the tribes by the Indian Service had come to an end.

This evidence of good faith was reinforced by the request that the tribes begin immediately to formulate the constitutions and charters authorized by the act. Reservation committees and groups set to work at the unaccustomed task of drafting constitutions and of making plans and programs for the economic rehabilitation of the tribes. Charters and constitutions under the Reorganization Act, when once adopted, cannot be revoked or changed by administrative action. Personal government of the tribes by the Secretary of the Interior and the Indian Commissioner is brought to an end.

INDIAN EMERGENCY WORK

In the revivifying of the Indian spirit, the wide-opened benefits of Indian emergency conservation and of other relief work played an important part. It must be remembered that on many reservations the kind of depression which struck the Nation in 1929 had been a chronic condition for a long time, becoming acute when land sales dropped off and the revenue from farm and grazing lands leased to whites dropped almost to the vanishing point. Opportunities for wage work had been all but nonexistent on most reservations, and the psychology of the chronically unemployed had prevailed for so long that it was feared that most of the Indians had become unemployable.

This fear proved to be groundless. Indians young and old not merely accepted emergency relief work, but almost fought for the chance to labor. And they labored effectively. Through their effort the physical plant, the land, the water, the forests, have had many millions of dollars added to their use value in the last 2 years. Incalculable benefits have been derived from the improvement of 20 million acres of range, through the development of springs and wells and the construction of thousands of stock-water dams, through roads and truck trails, through the construction of thousands of miles of fences and telephone lines. There is not one reservation which, as a result of the emergency and relief work, is not a better place to live on, an easier place in which to gain a living from the soil.

A clear gain to the Indians—and to many white communities in the Indian country—accrued out of the grants from Public Works funds for new Indian community-school buildings, hospitals, and sanatoria, many of them built entirely by Indian labor. Yet the pressing need for structures of this kind has not been half filled. Nor is the Indian irrigation program, financed from emergency grants, more than one-third completed.

AFTER THE DEPRESSION—WHAT?

The benefit derived by the Indians from the emergency and relief work has many aspects. Thousands of the Indian workers have, for perhaps the first time in their lives, learned what it means to have sufficient nourishment of the right kind regularly. Other thousands have been able to acquire minimal household goods, clothing, livestock, and farm implements. Thousands of savings accounts have been started at the various agencies out of earnings of \$2.10 per day for 20 days in the month during part of the year.

There have been entries on the debit side also. The number of bootleggers on the fringe of many reservations has multiplied; law enforcement has become more and more difficult. Automobile dealers with second-hand wrecks for sale have encouraged the younger Indians to obligate their potential earnings for years ahead; some traders have encouraged credit buying on far too lavish a scale.

But more important than these shortcomings due to the innate generosity of a race unfamiliar with wise consumption habits is the problem that arises from the introduction of a wage economy on reservations which will supply almost no permanent opportunity for wage work. After the depression is over and the emergency grants cease, what will happen to the now-working Indians?

REHABILITATION EMPHASIZED

To prepare for this inevitable crisis additional funds must be obtained for rehabilitation projects, such as land purchase, housing, the construction of barns and root cellars, the development of domestic water and sanitary facilities, the subjugation of land, the financing of purchases of seeds, implements, and livestock, the stimulation and development of Indian arts and crafts, and the organization and financing of sawmills, fisheries, and other industrial enterprises. This amended program would mean a playing down of the wage motive, a playing up of production for use.

If the necessary grants for this program be made, the Indians on many reservations should be able to pass gradually from relief work to subsistence farming, craft, and other supplemental industrial work of their own.

THE ISOLATION OF THE INDIAN SERVICE BROUGHT TO AN END

Through many administrations the Office of Indian Affairs monopolized the Indians. What services it could not render them were not rendered at all. The result was an insufficiency of substandard services. Since 1929 the Indian Service has worked increasingly toward the sharing of responsibility with other agencies. The Johnson-O'Malley Act, enacted at the beginning of the present administration, makes possible the varied use for Indians of the health, educational, agricultural, and welfare services of States.

Many nonofficial agencies have been brought into play in the Indian task, as mentioned in other pages of the present report.

Within the Federal system the outstanding unifications are those between the Indian Service and the C. C. C. (Indian Emergency Conservation Work, and the Indian Service and the Department of Agriculture (Soil Conservation Service). Continued or extended cooperation with the United States Public Health Service and with the Bureau of Animal Industry has gone forward. An entirely new collaboration with the Bureau of American Ethnology (Smithsonian Institution) has been achieved. Important help to Indians has been given through the past 2 years by the Federal Emergency Relief Administration, the Agricultural Adjustment Administration, and the Land Program (now brought within the Resettlement Administration).

Not merely have these many cooperative and sharing arrangements increased the services given to Indians; they have, in addition, reacted in a stimulating and challenging fashion upon the Indian Office. Not a sequestration of Indians within one Federal bureau, but the largest use of all the agencies of helpfulness, is the guiding principle in present Indian affairs.

PERSONNEL ADMINISTRATION

Superintendents' authority affirmed.—On July 14, 1934, a statement of new policies by the Commissioner, approved by the Secretary of the Interior, set forth principles of local self-management for unit groups of Indian Service employees. It gave to jurisdiction superintendents and their staffs the rights and responsibilities for local program-planning and for local administration. The end result of this policy, and the Indian Reorganization Act principles, taken together, will be the transfer of initiative and of much authority from the Washington office to the reservations. These measures mark, therefore, the beginning of a change in the whole trend of Indian Service administration.

Group planning sought.—Restoration to superintendents of the administrative authority they enjoyed up to a decade ago has been in no sense a return to the one-man control operation of former days. Superintendents can function effectively, under the new scheme of operation, only with the assistance of an organized staff and with the cooperation of organized Indian representation. Only through bringing about group thinking and group action can they help the Indians into an intelligible relationship with the various specialized Government services within reservation areas, and only by group action can they achieve the integration of these services into a rational and functional reservation program.

Thus partially released from administrative responsibility for jurisdiction programs and for jurisdiction employees, the technical and professional specialists of the Service, namely, the Washington office division directors and supervisors, have been freed to devote their energies to matters of policy, to consultant and supervisory services for field administrators and employees, and in the Washington office to the task of advice to the Commissioner and the Assistant Commissioner on the whole range of activities in their several fields of specialization.

By establishing, as a definite policy, visits to the Washington office by superintendents, individually and in groups, provision has been made for a continuous interchange of field and office viewpoints, and a means has been provided for the more efficient transaction of major jurisdiction business.

The year 1934-35 has seen these new policies of operation inaugurated and pursued in imperfect—as yet very imperfect—but persevering practice. The process has tried to be the slow but sure one of education, rather than the quicker but the more superficial and bureaucratic one of promulgation by regulation. Fifty-one of the 87 jurisdiction superintendents have visited the Washington office during the year. In the Washington office, weekly staff meetings of division directors, with visiting superintendents taking an active part have become an established practice. With the responsibility theirs for total jurisdiction administration, there has come about a changed attitude on the part of superintendents toward technical and professional supervision. Superintendents during this year have welcomed and have learned to seek the advice of division directors and supervisors. Altogether too much correspondence as yet continues to pass between the field and the office on matters that ought to be settled locally, but the foundation has this year been laid for a kind of field organization and field administration wherein superintendents assume their places as leaders, and whereby jurisdiction employees look to their local groups and not the Washington office for inspiration, guidance, and direction.

Decentralization begun.—The new Navajo and Pueblo agencies afford the extreme example of local administrative autonomy and likewise of the regionalization of planning and administration into large areas where homogeneous conditions or common imperatives exist. Each has a staff organization that duplicates, in effect, the division director and supervisory set-up of the Washington office. The superintendent of each of these regions is charged with the responsibility for program making, for controlling the shift of personnel, and, aside from budgetary limitations and within broadly defined policies, for operating with the utmost possible freedom from Washington office intervention.

In the Navajo case there are involved some 46,000 Indians (including the Hopis) and a 20,000-square-mile area, and the social-economic program is complex as well as urgent. In the Pueblo case 17 tribes, cultures, and more or less distinct civilizations are involved. Regionalization in this area is the means not merely, nor principally, to a more autonomous and better manned regional service, but rather, and principally, to a localization of program and of community action tribe by tribe, village by village.

In California and in the Lake States of Minnesota, Wisconsin, and Michigan regional coordinators have been designated during the past year. These men act as advisers to the superintendents in their respective territories, assist them on problems of planning and administration, and serve as liaison officers between the office and the superintendents.

While attention this year might seem to have been centered unduly on problems of organization and administration, it must be recognized that these matters are fundamental to the building of an improved personnel and service. No organization can amount to anything worthwhile without the right kind of personnel, especially in the subordinate positions of a wide-spread service; it cannot do itself justice in the absence of a right organization that operates on sound principles of human relationships and is conducted on a clearly defined business basis. At best, any Government service confronts a new employee with a bewildering maze of restrictive hurdles; at worst, it stifles initiative, breeds inertia, and serves as a refuge for the mediocre. In the past, and up to the present even, the Indian Office has tried to improve its personnel service by creating new activities and adding new personnel with little regard to the fundamentals of organization and administration. The recognition of superintendents as responsible administrators and the partly realized functioning of jurisdiction staffs with defined lines of delegated administrative responsibilities and authorities assume, therefore, a spe-

cial significance in relation to Indian Service personnel policies of the future.

Employees.—On July 1, 1935, there were 5,463 "regular" positions in the Indian Field Service carrying gross salaries in the amount of \$8,600,088. This does not include the 293 positions set up for Alaska, organization chart positions in our irrigation service, nor any of the emergency activities.

INDIAN EMPLOYMENT OPPORTUNITIES PLACEMENTS OF INDIANS

Through local personnel committees on each jurisdiction, an inventory of Indians qualified for employment in the Indian Service has been set under way this year. Two hundred and eighty-six Indians have been appointed to regular permanent positions in the field, and the number of Indian employees in the Washington office has been increased to 32. Of a total of 5,463 regular classified positions in the field service, 2,037 are filled by Indians (Jan. 24, 1935). One man of Indian blood is serving as supervising coordinator of all Indian activities in three States. More than a dozen are serving as reservation superintendents, school superintendents, and principals. All of the field agents of the new Indian reorganization unit are Indians.

Exact data are not available as to the number of Indians employed on various Public Works and Emergency Conservation Work projects, but approximately 90 percent of the total personnel employed are Indians.

In-service opportunities through Indian assistantships now include positions in clerical work, education, extension, and forestry branches of the Service. The Health Division set up the new position of junior nurse to give employment as nurses to Indian women immediately upon completion of hospital training. At selected hospitals in the Service, 1-year employment in attendant positions is designed to give Indian girls, who expect to enter training, advance experience in hospital routine and the opportunity of earning money to meet their expenses during the period of their hospital training.

This showing is perhaps a modest and an insufficient one; but it is believed that the procedure set up, when reinforced by the changes in the educational system later reported on, will shift upward, with yearly acceleration, the curve of Indian employment, while convincingly lifting the level of the personnel without regard to Indian and white distinctions.

Placement of Indians.—The total number of Indians for whom employment was obtained through the Employment Division during the fiscal year 1935 was 11,568, or 21.7 percent more than in

the previous year. Of this number, 7,750 were employed within the Indian Service and 3,818 were placed outside the Service, 2,016 with private employers and 1,802 on Government projects. Of the latter, 1,517 placements were effected directly through the offices of the National Reemployment Service to which employment officials of the Indian Service referred applicants.

Indian Service placements increase.—Comparison of these figures with those for the previous year shows a decrease of 44.3 percent in placements outside the Indian Service and an increase of 116.3 percent, or 4,116, in the number placed by the Employment Division within the Service. This shift in relative volume of "outside" and "inside" placements was due principally to the greater opportunities for employment of Indians on reservations and at agencies, but was influenced by diminished opportunities for Indians elsewhere, due partly to preference shown non-Indians in some sections because of a popular belief that the Government was providing adequately for all Indians. In certain other areas, in contradistinction, it is probable that several hundred Indians were placed by offices of the National Reemployment Service without the fact being reported to the Indian Service. During the previous year employment agents familiarized Indians in many communities with the facilities of the Reemployment Service and of State and municipal employment services accustoming many Indians to utilize such agencies.

Household work placements decrease.—In some of the urban districts, where placements have been mainly those of women and girls in household occupations, the demand for Indians at times during the year 1934-35, has exceeded the available supply, and placements have fallen off in consequence. This situation may be attributed largely to the increased opportunity for employment on reservations, which has given jobs to many Indian women and girls at agencies, schools, and hospitals, and has made it unnecessary for others to earn their own living away from home. A further important reason for a decline in the number of household placements is that definite efforts have been made by social workers attached to the Employment Division to raise the standards of such employment and to stabilize it; this has meant fewer placements but more continuous employment.

Individualized placement work sought.—The various conditions described have required of employment officials more of selective individualized placements and less of mass recruiting of labor than heretofore. The employment of large numbers of Indians within the Service is making possible the compiling of individual records which will be valuable when employment opportunities on the reservations diminish or when labor demands of private business increase.

Employment officials are assisting recently established local employment committees at each agency and nonreservation boarding school, in building from such data accurate lists of available Indians and their qualifications.

EXTENSION AND INDUSTRY

This division seeks to raise living standards among Indians by helping them to make wise use of their resources—which are often meager. Programs are based on physical inventories of reservation resources, and they are worked out locally in cooperation with the Indians.

Indians lost ground in the extension-work field in 1934–35 because of the drought; on the other hand, some Indians gained, unexpectedly, through receiving drought cattle, bought by the Government in drought-stricken areas, and redistributed on 48 reservations where there was still feed.

Of general benefit, as yet unrealized, will be the revolving loan fund under the Indian Reorganization Act, authorized but unappropriated for in 1934, and finally included in the appropriation act of 1935. Studies regarding the use of the fund were initiated, and rules and regulations under which loans are to be made are already being drawn up.

FARMING

The majority of the Indian reservations lay within the emergency drought areas during 1934. The acreage cultivated showed a decrease of approximately 15 percent since 1933, and the number of farms operated decreased from 30,278 in 1933 to 29,025 in 1934. The acreage planted in cereal crops showed a decrease of 7.92 percent, while yields decreased 38.7 percent. Other field crops showed a decrease of 18.8 percent. Cotton production showed a decline from 1933 of 56 percent, and sugar beets, 60 percent. The acreage in forage crops decreased 3,405 acres, and yields, 37.9 percent. A total of 25,840 acres was planted to gardens by 26,854 Indian families.

Horticultural projects were the only farming activities showing an increase in spite of the drought, due to the fact that reservations on which such projects play a large role are either under irrigation or in areas outside the drought section.

LIVESTOCK

Cattle.—The Indian cattle industry has been given a real impetus through the allocation of \$800,000 to the Indian Service by the Agricultural Adjustment Administration for the purchase of purebred cattle from distressed breeders in the designated drought areas.

Arrangements were also made with the Federal Surplus Relief Corporation whereby cattle were turned over to the Indians for the purpose of establishing foundation herds. The income from cattle enterprises increased, some of which was due to sales made to the A. A. A. under its drought-relief program.

The number of Indians owning dairy cattle increased during the year by 44 percent. The number of animals owned increased 57 percent. It is estimated that 28,538,622 pounds of milk were produced by Indian-owned animals and that 443,620 pounds of butter and 21,925 pounds of cheese were made. In the beef-cattle project an increase of 60 percent in the number of Indians owning cattle was shown. Their holdings increased 62,030 head, or 37 percent.

	Dairy cattle		Beef cattle	
	1933	1934	1933	1934
Number of Indians owning.....	6,336	9,133	8,627	13,787
Total number owned.....	16,406	25,711	167,313	229,343
Average value per head.....		\$23.07		\$18.95
Total value.....		\$593,127		\$4,346,307
Number of live animals sold.....	252	2,171	12,284	36,046
Amount received.....	\$3,603	\$36,008	\$210,609	\$578,070
Pounds dressed meat sold.....		3,500	793,063	547,179
Amount received.....		\$245	\$52,486	\$44,820

Total income received from cattle: 1933, \$266,698; 1934, \$659,143.

Sheep and goats.—Sheep and goats are important in the economy of large numbers of Indian people, especially in the Southwest. In the Navajo country the desperately overgrazed condition of the range was accentuated by drought, and as a relief measure \$250,000 was secured from the Federal Surplus Relief Corporation, with which 49,052 sheep and 147,787 goats were purchased. The drought also forced Indians on other reservations to sell sheep. In the following table a decrease will be noted from 1933, largely due to efforts of extension workers to bring the number of stock owned by the Indians more nearly within the carrying capacity of their ranges.

	Sheep		Goats	
	1933	1934	1933	1934
Number of Indians owning.....	7,527	9,213	5,842	7,681
Number owned.....	1,051,079	901,765	353,190	215,566
Number live animals sold.....	94,226	156,571	2,654	150,884
Pounds dressed meat sold.....	202,530	101,450	43,625	31,450
Received live animal, sales.....	\$306,652	\$366,946	\$3,872	\$156,478
Received dressed meat, sales.....	\$18,240	\$9,686	\$5,672	\$2,786

Amount received from wool and mohair sales: 1933, \$430,635; 1934, \$505,919.

Total income from sheep and goats: 1933, \$795,071; 1934, \$1,041,815.

Swine.—Of 31,553 swine owned, 19,600, or 62 percent, are found in Oklahoma. This project was affected by drought in some sections. The increase in the number of Indians owning swine was 886, or 16.71 percent, and the average number owned per Indian owning was 5.51 in 1934.

Horses and mules.—These animals are relatively more important to the average Indian than to the average white farmer. In the service as a whole there is need of better-bred horses of the various types. Owing to the drought, Indians in some sections were obliged to sell large numbers of animals. This will severely affect their future farming operations unless some means can be found whereby additional horses can be purchased. The number sold increased from 7,946 in 1933 to 17,416 in 1934. At the close of 1934, 34,009 Indians owned 134,863 horses.

Poultry.—Efforts in most sections were devoted to encouraging poultry raisers to supply fresh eggs for family use and some birds for consumption rather than for commercial activities. Birds slaughtered totaled 90,291, and the amount received from sales was \$38,058 for live birds and \$16,745 for dressed meat. At the close of the year Indians owned 363,384 birds. It is estimated that 1,357,774 dozens of eggs were produced during the year.

NAVAJO SHEEP-BREEDING LABORATORY

An appropriation of \$75,000 was included in the general appropriation for the Indian Service for the coming fiscal year to establish and operate a sheep-breeding laboratory on the Navajo Reservation. The problem is to build up a breed of sheep adapted to Navajo climatic conditions, whose wool will be suited to the making of Navajo rugs and at the same time will be salable on the open market. Plans were being made at the close of the fiscal year for the opening of the laboratory. The Department of Agriculture has rendered and will render important cooperation in this enterprise.

4-H CLUB WORK

A total of 294 organized clubs carried projects with a membership of 4,290. Of these 3,128 completed their projects, or an average of 72.91 percent. This figure is outstanding when it is considered that many were unable to complete due to the drought.

HOME EXTENSION WORK

In spite of the drought, home-extension projects continued to make substantial progress. Results showed conclusively that the Indian women respond to this type of activity, and that the practices

which they have learned since this work was first inaugurated are not easily forgotten. Canning projects showed the following results in quarts: Fruits, 383,865; meats, 108,586; vegetables, 241,338; fish, 2,552. Drying projects showed the following results in pounds: Fruits, 192,258; meats, 2,254,078; vegetables, 224,670; fish, 153,626. The huge increase in meats is due, of course, to the cattle which were turned over to the Service from drought-relief purchases. It is estimated that 12,536 Indian homes were helped in adopting improved practices in canning and drying; 2,501 in bettering their clothing; and 5,605 homes with various projects carried cooperatively with the General Federation of Women's Clubs.

FARM AND HOME BUILDING

The construction and remodeling of farm and home buildings continued to be pushed. A total of 1,217 new dwellings was constructed at an estimated cost of \$440,695, and 1,668 dwellings were remodeled, the estimated increased value of which was \$173,444. Sanitation of home surroundings was stressed and 638 toilets constructed.

GENERAL EXTENSION WORK

The following figures summarize general extension work:

Extension workers made 160,194 farm and home visits during the year. A total of 338,977 office and 76,214 telephone calls were received. Workers wrote 75,372 individual letters, prepared 1,296 different circulars, of which 85,075 copies were sent out, and distributed 35,667 bulletins. Exhibits were shown at 511 events; 346 training meetings were held for local leaders, at which 4,736 were in attendance; 5,857 demonstration meetings were held, with an attendance of 94,977; 161 tours conducted with an attendance of 1,942; 92 achievement-days held with an attendance of 16,615; and 3,415 other extension meetings held with an attendance of 200,912. There were 1,597 meetings held by local leaders, with an attendance of 32,153. All meetings held during the year totaled 12,634, compared with 11,128 last year; and attendance totaled 380,739, compared with 309,510 in 1933.

REIMBURSABLE FUNDS

The entire appropriation of \$325,000 for industrial purposes was allotted the various reservations during the fiscal year 1935. This fund was supplemented by allotments aggregating \$106,998.33 from tribal revolving funds belonging to the Indians of 22 reservations. The greater proportion of the funds from these two sources was used for industrial loans. According to reports which have been submitted, only \$16,935.24 was used for subsistence loans as compared with \$29,787.09 in the fiscal year 1934, while the amount expended for educational loans to young Indian boys and girls was \$18,806.61, or \$400.16 more than last year.

COMING DEMANDS

The successful attainment of the objectives of the Indian Reorganization Act, namely, opening to Indians the opportunity and techniques for self-support, is to a large extent dependent upon the extension staff. If the standard of living of Indians is to be raised through their own efforts, it is imperative that extension work have both an enlarged personnel and increased funds for demonstration and other purposes. Results which have been achieved in the past show that the value of the work is recognized by the Indians. The limited personnel of the Extension Division makes it impossible to extend the benefits of this work to many Indians who should receive assistance. As an example, the benefits of 4-H club work are available to only 1 out of 8 boys and girls. The new credit system will also increase demands made upon extension workers in planning farm programs and in insuring sound economic use of these funds.

EDUCATION

New educational objectives.—Far-reaching changes in the methods and objectives of Indian education were carried forward during the year. The process of shifting the emphasis from the Indian boarding schools, reservation and nonreservation, continued, but at diminished speed so far as enrollment was concerned. The opposition of Indians who wanted to hold to the extraordinary but dubious privilege of having their children not only schooled but fed, housed, and clothed at Government expense, plus the pressure of communities enjoying the business arising out of the presence of Indian boarding schools, was sufficiently powerful to force enlarged enrollment at several nonreservation boarding schools and to compel the continued operation of one school scheduled for closing.

Nevertheless steps were taken during the year to transform non-reservation boarding schools into specialized institutions serving more distinctively than in the past as vocational training centers and preparing adolescent Indians for more effective work, either for themselves or for the Indian Service on their reservations. At the same time efforts were made to set more realistic objectives for the day schools operated by the Service. For many years the Indian day schools have been content with educational methods and goals that have become obsolete in the better white American schools. During the preceding administration the academic and technical standards of the teaching personnel had been greatly improved, but the objectives of Indian education had remained relatively unrealistic, relatively disconnected from the environment in which the graduates of Indian schools must make their lives. Now a new orientation of Indian day-school methods and purposes has been initiated.

Gradually these schools are becoming community centers, focal points of community activities and organization. Gradually they are beginning to train the young in better methods of play and work in the Indian environment, to bring to the children—and their parents—the skills necessary to gain a better living and a fuller life through the effective development and use of Indian resources by the Indians.

The Indian educational policy of the past adopted the solidified methods and aims of the kind of rural white education which has since become obsolete in the more fortunate areas of white life, and it clung to them practically without change until the preceding administration began to raise the level of the teaching personnel, teaching methods, and supervision. But the aims and objectives were not changed materially, except to adapt them to the prevailing style in which the college-entrance examination is the alpha and omega.

For many years to come most of the tribes will continue to live as several million white rural families are living, depending on the land that is theirs to produce subsistence-plus. Therefore, it should be the aim of Indian education, at least for the next generation, to deliver Indian adolescents fully and practically prepared to make the most of their available resources, adolescents in whom the tie that binds them to their homeland has been strengthened rather than broken, Indian youths with wide horizons, bilingual, literate, yet proud of their racial heritage, to become completely self-supporting, even though going without some of the mechanical accessories of the present day.

At the same time, Indian education must reckon with the fact that there will be Indian children for types of employment removed from the Indian reservations; also that there will be Indian children of more than ordinary ability and talents who must be given an opportunity to develop this ability and these talents to the highest possible point for use either in the white competitive world, in Indian life on the reservation, or in the Federal Indian Service. For the last group, the Indian Reorganization Act opened the door wide by removing the civil-service bar of high academic requirements as a prerequisite of employment. As a result of this reform, there has been a steady influx of new Indian employees into the Indian Service during the fiscal year.

Nonreservation secondary schools.—In the effort to make Indian schools more serviceable to Indian community and reservation life, a general statement of policy relating to Indian secondary schools was prepared, together with a definition of their aims, admission requirements, and general training courses. Definite steps have been

taken by the superintendents and staffs of their schools to modify and develop their programs in conformity with this policy. Emphasis is being placed on training in specific skills which will be of use to Indian boys and girls in making a living in their own communities.

During the present year the nonreservation vocational schools have established intensive short courses for selected Indians. Four highly successful 5-week courses for Indian tractor operators and mechanics were conducted during the spring months. The men enrolled were carefully selected from emergency conservation, irrigation, road, and agency personnel. They received practical training from instructors furnished by manufacturers and distributors of tractors, graders, and air compressors. These courses are forerunners of a variety of intensive short courses planned for Indian vocational schools.

Attendance in boarding schools.—The Indian boarding schools, including reservation and nonreservation institutions, have enrolled in the past a considerable number of pupils who properly were not boarding-school cases. In keeping with the new policy of caring for the education of the Indians through local facilities wherever possible, instructions have been issued defining the types of boys and girls to be admitted. The responsibility for selection is placed jointly on the jurisdiction superintendents and their staffs and on the heads of the schools. The regulations state:

These boarding schools are primarily for (a) children who cannot be furnished with suitable education near their homes either in Indian or public schools; and for (b) homeless children or children from unfit homes who live in districts where there are no social agencies equipped to make the necessary adjustments for them. . . .

Poverty in the home will not be considered sufficient reason for admission unless there are no resources from which the distressed home may obtain relief. The problem of economic security is not solved by removing children from their homes. A more basic approach to the problem must be made in an effort to build up means of family support supplemented, if necessary, by work relief or by direct relief.

Children who have been adjudged by competent authority to be feeble-minded or delinquent will not be admitted to boarding schools, as such children require specialized care not available in schools which are set up for normal children. Problem children and those who appear to be mentally subnormal should not be recommended for enrollment without diagnosis by competent persons, nor should problem children in boarding schools be dismissed without such diagnosis. . . .

As an experiment in determining how the work in some of the reservation boarding schools, which usually include students of the first nine grades, may be redirected in order to serve more closely the needs of the Indians, two agricultural apprenticeship courses were started in April and are now in successful operation. Both are in

Oklahoma, one at the Fort Sill and the other at the Riverside school. Twenty students, boys and girls who were finishing the ninth grade, have been held in school for a 20-months' continuous course in practical agriculture. To each boy has been assigned some 5 acres of farm land. He is cultivating his plot wholly by himself, and growing those crops he would raise for his family on his own farm. To each has been assigned 1 cow in the dairy herd and 1 sow. In addition to the practical fieldwork, requiring 6 or 8 hours a day, the boys are studying in the library and conference room practical materials needed for their work. Each girl is undertaking similar work, cultivating a small kitchen garden, taking care of an individual pen of poultry, making butter and cheese, and learning to clean and bunch vegetables and to cure meats and make sausage.

Trachoma school.—Because of the large number of trachomatous children among the Apaches, all seriously affected children of school age were placed (October 1934), with their parents' consent, in one center, the Theodore Roosevelt Boarding School at Fort Apache.

Here intensive treatment was provided. Preventive as well as therapeutic measures were stressed with the view that the boys and girls would carry back into their homes practical means of avoidance of the spread of the disease among adults as well as among babies and children. Play, scholastic activities, and treatment have been happily combined in the school, and while it is too soon to judge fully the results of the demonstration, there is sufficient evidence of the success of the effort to warrant continuing the trachoma school at Fort Apache and to plan for the development of other trachoma schools.

Health institutes.—To prepare Indian girls of the Southwest to assist trained nurses in the prevention of disease and the care of the sick, two 5-week health institutes have been offered at the Santa Fe Indian School during the summers of 1934 and 1935. Two hundred and ten young women have availed themselves of this opportunity, 15 of whom are now engaged as health aides in Navajo community schools. It is proposed to place others in suitable positions as soon as funds permit.

As all of the girls admitted to the courses were of marriageable age—and some of them mothers—thorough, practical courses were planned with the view of preparing them—as wives, mothers, and neighbors—to promote health and to prevent disease.

Eager, intelligent interest was displayed by the students, and the project has met with the hearty approval of the adult Indians.

It is proposed to continue these institutes in the Southwest and to establish training courses in health for other Indian girls, as circumstances permit.

Library survey.—Miss Florence Bradley, whose services were lent by the Metropolitan Life Insurance Co., made a 1-month study of Indian Service libraries. Her report will be an important aid toward the better use of our limited school and agency library facilities.

Special summer schools.—For the double purpose of giving boarding-school teachers an opportunity to become thoroughly acquainted with Indian life and for the help of Indian children attending public schools, over 100 teachers were assigned to conduct some 40 summer schools on reservations or in Indian communities. Public school buildings, churches, or other available quarters were used. The schools were open for 6 to 8 weeks. The teachers assigned were largely those teaching academic grades. Pupils of all ages were enrolled. The teachers broke away from standardized and formal education, adopted certain activities as a basis for their work, with reading, writing, and arithmetic as supplementary work based on the project activity. In all of these schools vigorous attention was given to teaching practical cleanliness and health.

Government day schools.—Indian Service day-school attendance has risen from 5,063 in 1932 to about 9,000; but to an outstanding degree it is the qualitative, not the quantitative, change in day schools that calls for notice. In the past they were largely replicas of public schools. They now, by and large, serve as pioneering agents, going far beyond the public schools in the flexibility of their curriculum and in the many-sidedness of their uses. Efforts are being continued to develop these institutions to concern themselves not only with the practical education of the children enrolled but with educational and welfare activities for the adults in the territories served by them. Increased effort has been made and will continue to be made to relate their work to the Indian homes and communities. Emphasis is placed on good health and on good living habits. Shopwork for boys, for the making of things useful in the homes of the Indians or in connection with their labors, is emphasized; likewise, home-making activities for girls is a prominent part of the schoolwork.

The possibilities of a day school as a community haven are shown in a report of an observer outside of the Indian Service, Mr. S. L. Smith, director of the southern office of the Julius Rosenwald Fund. He visited a group of special Indian schools in the State of Oklahoma. The following is paraphrased from his report:

Kallihoma school, Pontotoc County.—This is a community far back in the country, where the Indians, mainly Choctaws, are poor in wealth and, until recently, in spirit. They had no school. They determined to have one. They raised among themselves \$1,300 for the project. An able Indian carpenter assumed the leadership. An expert from the State schoolhouse building division laid off the site and made plans for the school, the teachers' home, the community house, the blacksmith shop, and garage.

An old frame hotel in the nearest city was bought for a very small amount, carefully torn down by the Indians of the community, and hauled to the school site. From this salvaged material the new buildings were erected. The Indians themselves did the work. It was done in 1933.

A Klamath Indian is the principal. He not only instructs in the classroom but directs community activities, practical shopwork with the men and boys, and his wife (a Cherokee Indian) directs, in the rustic community house, work with the women. It is equipped with sewing machines and kitchen utensils, including two steam-pressure cookers for canning meats, vegetables, and fruits for the school and the community. There is a demonstration garden at the teacher's home, a cow, good hogs, and purebred chickens. There is a radio and a victrola for the use of the community and in the school a piano.

A stone reservoir is built on the hillside above the home, which is supplied with water from a deep well and a force pump.

In connection with this school project the Federal Government contributed only \$300 to help buy furniture and equipment and expended \$125 under the civil-works program on the community house. The plant so excels the white school in the neighborhood that the whites are now asking to attend the Indian school. The white school has since employed the Indian carpenter to build a teacher's home, using the same type of material in construction as that used in the Kallihoma community house. The efforts of the Indians toward self-improvement and self-expression have commanded greater respect from the whites in the community and therefore a more cordial relationship. The influence of the school activity is spreading to the Indian homes; several new houses similar to the attractive log community house have already been erected. The social force created in this building project is increasing in momentum and is reconstructing the life of the community and integrating these people into useful citizenship. If the Government had planned and built this plant, putting into it \$6,000 to \$7,000, it would have been completed sooner, but it would have robbed the Indian community of the rich opportunity of self-development and culture which cannot be handed down but must be built up.

Navajo community day-school Indian personnel.—In planning for the 46 new community day schools in the Navajo jurisdiction, young, intelligent Navajo men and women have been selected as assistants, housekeepers, health aides, etc.

This is a departure from the usual Indian Service procedure but is a distinct step toward the desired goal whereby Indian schools will be manned by Indians. Though still in the experimental stage, the Indian personnel of about 100, selected and placed from 375 applying (before June 1, 1935), gives promise of most satisfactory service.

The success of the venture will lie in our ability to provide sufficient intelligent, sympathetic, trained supervision to assure the development of these untrained but eager Indian workers.

Scholarship loans.—During the year Congress appropriated under the provisions of the Indian Reorganization Act \$175,000 for scholarship loans. This is not available to the members of any of the tribes which have voted not to accept the provisions of the act. Of this amount, \$35,000 is available for loans for education in high schools and colleges and \$140,000 for training in recognized vocational schools. In order to carry out effectively the provisions of this act

a scholarship loan and employment committee has been organized in each jurisdiction. This committee is actively searching out able and needy Indians who should receive further education than can be obtained near their homes or in the Indian nonreservation vocational schools. Loans for the coming year are made on the basis of the recommendations of these committees.

During the year 1934-35, with money made available previously by Congress, scholarship aids were granted Indian students as follows: \$14,887.87, nonreimbursable, for tuition and fees in nonsectarian institutions; \$13,310, reimbursable loans from Federal funds; \$5,496, reimbursable loans from tribal funds; and 93 working scholarships covering board and room for nonreservation boarding schools while attending nearby colleges and other institutions. With these aids 204 Indian students were enrolled in colleges and vocational schools throughout the United States, in most instances attending the institutions nearest their homes. They were pursuing a wide variety of courses, as is indicated by the following distribution: Teaching, 64; engineering, 15; commercial studies, 14; nursing, 13; forestry, 12; home economics, 12; agriculture, 8; art, 8; business administration, 8; physical education, 7; mechanics, 6; social work, 6; music, 5; law, 4; medicine, 4; carpentry, 3; electricity, 3; journalism, 3; architecture, 2; aviation, 2; ministry, 2; baking, 1; beauty culture, 1; and dramatics, 1.

Federal-State relations.—Under the Johnson-O'Malley Act, passed in April 1934, contracts have been made with two States—California and Washington—under which the States assume, in consideration of funds provided by the Federal Government, the obligation to educate all the Indian children within their boundaries. Negotiations are under way at the present time with several other States, and it is expected that within the next year similar contracts may be made by at least two of them to assume all, or at least part, of the burden of the education of Indian children.

Education of natives of Alaska.—The Office of Indian Affairs conducts 99 day schools and 2 boarding schools for Indians and Eskimos in Alaska. These have a total enrollment of about 4,300 pupils. Due to numerous delays in securing teachers, 4 schools were closed during the year and 7 others were in operation for a few months only.

A second supervisor of elementary education and a supervisor of social welfare were added to the Alaska school staff.

All the day schools are of the community type, serving adults as well as children. Most of them are in isolated villages where the school is the center of all community activity. The teacher must, of necessity, serve as physician and nurse, and supervisor of gardens, of cooperative stores, of reindeer activities, of marketing of

urs and purchasing supplies, of recreation, of economic enterprises and village government. He must take a real interest in the people he serves and be able to win and hold their confidence.

There is immediate need for replacement of worn-out shacks which, in many instances, are now serving as schoolhouses and teachers' quarters. Unless new buildings are provided within the next year or two, some schools will have to be abandoned altogether.

There are at least 25 villages, with 25 or more children of school age in each, which have never been provided with schools. The Federal Government has a duty to these Indian children which it has long ignored. They are entitled to an education.

We are trying to make the actual teaching in the schoolroom seem interesting and vivid to the native children. Text material is constantly being revised so that it will deal with objects familiar to the Alaskan natives, and the subjects taught are those which will fit the child for better living in his own environment.

APPLIED ANTHROPOLOGICAL RESEARCH

During the current year considerable success was obtained in the utilization of the results of anthropological and other social-science research in relation to practical problems of Indian administration. Through Dr. Duncan Strong, loaned by the Bureau of American Ethnology, Smithsonian Institution, certain studies essential to the organization and functioning of the new tribal constitutions were instituted. A number of ethnological collaborators were employed in this work. Efforts were concentrated on the various Sioux Reservations, among certain of the Pueblo groups, and elsewhere. One of the purposes of these studies concerned the determination of natural Indian communities within the reservations which could be fitted into the new constitutions as drawn up by the Indians.

Several projects in connection with the practical utilization of Indian languages were also prosecuted. These included courses for interpreters, Indian Office personnel and interested Indians on the Navajo Reservation under the direction of Father Berard Haile, Dr. Edward Sapir, and Dr. Gladys Reichard, respectively. In order to enlist the cooperation of the field personnel in certain aspects of anthropology valuable in their professional duties, recommendations were sent out concerning anthropological literature and in regard to summer courses in the social sciences which it might be possible for them to attend. For the Southwest, Miss Ruth Underhill was engaged to give a series of courses involving Indian background, and a large group of Indian Service employees took the 6 weeks' course at Santa Fe. The course was repeated in the summer of 1935 under the auspices of Sherman Institute.

HEALTH

Staff and equipment.—Health work among Indians is carried out by a field personnel of 141 full-time physicians, 85 contract physicians, 13 full-time dentists (including 1 detailed to Alaska), 13 part-time dentists, 100 field nurses, 362 hospital nurses, and 645 other employees. The appropriation for health work in 1935 totaled approximately \$3,486,085.

During the fiscal year 92 hospitals, with 3,665 beds, and 14 sanatoria, with 1,197 beds, were in operation. The tuberculosis sanatorium at Onigum, Minn., burned. All patients were transferred safely to the State sanatorium at Ah-Gwah-Ching, and there were no casualties as a result of the fire. Fortunately, the new Government wing at the State sanatorium at Ah-Gwah-Ching is completed, accommodating 117 Indians patients, treated on a contractual basis with the State board of control.

The only new hospital under construction at the present time is that on the Colville (Wash.) Reservation.

These figures show the need.—During the fiscal year the Indian birth rate was 21.2 per thousand; the death rate, 14.7; infant death rate under 1 year of age, 120.2 per thousand infants born, exclusive of stillbirths. These figures might be compared to the census of 1932 of the registration area of the United States, in which total births were 17.4 per thousand; deaths, 10.9; infant mortality, 57.6. This is indicative of a larger birth rate among Indians than among the general population, but with a much higher death rate.

Of the total number of Indians examined in hospitals and outpatient clinics, 28.1 percent were found to have tuberculosis, all forms, active and inactive; 32.3, trachoma; 17.8, venereal diseases. These figures are sad evidence of our three major health problems.

Health surveys and institutes.—During the year the Phipps Institute conducted a tuberculosis survey at Tucson, Ariz., in which 508 Indians were examined, of whom 402, or 79 percent, were found positive to tuberculin. Sixteen had open pulmonary tuberculosis.

The American Social Hygiene Association conducted a series of institutes in venereal disease control for nurses and physicians in the Navajo area and at Carson School, Nevada. These institutes were so marked a success that they will be continued during the next year. Dr. Walter Clarke, of the American Social Hygiene Association, has been appointed special consultant to the Indian Office in venereal disease at a dollar a year, and Dr. Esmond R. Long, of the Phipps Institute, has been appointed special consultant in tuberculosis at a dollar a year.

In cooperation with the Cattaraugus County Health Unit, New York, a tuberculosis survey was conducted among Indians on the

Alleghany reservation. This survey is not yet completed; over 500 have so far been examined, with 78 reported as positive for tuberculosis but inactive. This incidence among the group so far studied is much lower than was thought to exist.

A clinical survey of disease conditions among Indians was made in Adair County, Okla. The Indians cooperated willingly and complete physical examinations were given to 1,083, 52 percent of whom were full-blood Cherokees. Eighty percent of those examined were in need of dental treatment; 35.6 percent had diseased tonsils; and 10.2 percent enlarged thyroids. On the other hand, active trachoma was found in only 1.2 percent of the cases examined, and venereal disease as shown by a positive Kline test was found in 2.6 percent of the 638 cases so examined. The tuberculosis survey is not yet finished as X-ray examinations are being used to follow up the diagnoses among the 75.3 percent positive reactors of the 743 who were given the Mantoux test. It is of interest to note that the positive reactors increase from 40.9 percent in the first 5-year-age group to 94.9 percent in those over 50 years of age.

During the period from March 20 to April 5, 1935, inclusive, a general health survey was undertaken for the Seminoles of Florida. The purpose of the survey was to ascertain the physical condition and health status of this group of Indians with a view of determining their health needs. For comparative purposes the examination of a like number of Indians, whites, and Negroes was made. The survey was a combined effort of State and Indian Service health organizations. Owing to the reluctance of most of the Indians to come for examination to the clinics, it was impossible to examine more than a very small group, altogether only 46 Indians. This group is too small to be of any considerable value in determining the health status of these people, but the survey has been of value in that much of the health information corroborates the conclusions of medical observers and agency records of the past. It certainly does not indicate any alarming health condition. It bears out the observation that there is no trachoma, and a very low morbidity for tuberculosis, both of which are major health problems among other Indian tribes. Venereal disease was shown to present no alarming problem, but under existing circumstances may be expected to increase. The prevalence of disease among the Indians, whites, and Negroes, as shown by examinations, is indicated in the table below.

	Indian	White	Negro
Total number:			
Examined.....	46	41	17
Positive Mantoux test.....	4	4	1
Positive syphilis.....	1	2	0
Malaria.....	0	0	0
Trachoma.....	0	0	0

The outstanding conclusion reached as a result of the survey was that the prevalence of disease among the Seminoles of Florida is no greater than that among either the whites or the Negroes in a like economic status in the same neighborhood, except that the Indians were shown to have more dental defects than either of the other two groups.

Cooperation with other organizations.—Beside the American Social Hygiene Association and the Phipps Institute, the Indian Office is cooperating with the Carnegie Institution of Washington in a nutritional survey among the Pueblo Indians at Albuquerque, and is continuing in its activities in connection with the State boards of health in Florida, North Carolina, Wisconsin, Minnesota, Montana, and California.

Cooperation from Public Health Service.—Continued cooperation is maintained by the Public Health Service in the detail of personnel to the Indian Service. This includes medical officers of the Public Health Service as well as sanitary engineers, who are rendering valuable service in inspection of water supplies and sewage disposal systems.

Nursing service.—A much needed increase of nurses in the hospital service has been made during the past fiscal year. But we are still understaffed in many of our institutions, and the use of the hospitals increases. As more serious cases come to the hospital, the variety of nursing care has grown more complicated.

The most interesting development in the nursing work has been the plan to give instruction to Indian girls to prepare them for hospital work as aids to nurses. From this type of employment they may go on into professional training or they may continue in the Indian Service hospitals, giving the simpler types of nursing care under supervision of the graduate nurses.

The following interesting figures denote the increase of employment of Indian girls who are graduate registered nurses. Late in the fiscal year 1934 we had 22 Indians on the nursing staff. There are now 42 employed. It has been our policy to encourage training in white hospitals by arranging for nursing scholarships, by selecting suitable high-school graduates as trainees who have ability and interest in helping in the boarding-school infirmaries. Employment after graduation can be assured and we are finding these young women well qualified not only to serve but also to educate their people in accepted health practices.

The field nursing program in control of communicable disease, maternity and infancy hygiene, and health supervision has been continued. More of this type of service is in demand. The Indians are aware of their need for guidance and instruction. There is much yet to accomplish in order that all may be served.

A survey of the quality of nursing care was made by the consultant nurse of the United States Public Health Service, and some of our needs were pointed out.

To improve the type of care in our hospitals, and to develop better service in the field, are objectives that can be accomplished only by constant checking of existing work and by numerical increase in staff where the patient-nurse ratio indicates the need.

Dental service.—The isolation and distribution of the Indian population make it impossible to furnish adequate dental service with the small number of personnel employed. Many jurisdictions are visited by the dentist only once in 2 years.

A number of the full-time dentists who serve several reservations and Indian schools have been supplied with light delivery cars to facilitate transportation of their equipment and to expedite their travel. One mobile dental clinic was purchased during the year for use in the Pueblo country.

Alaska medical service.—Early in the fiscal year Dr. Vance B. Murray was detailed by the United States Public Health Service as director of the Alaska medical service, with headquarters at Juneau, Alaska.

Dr. Murray proceeded at once to Alaska, taking with him his personally owned airplane for use in traveling throughout Alaska on trips of investigation and inspection. By this means, Dr. Murray was enabled to visit all of the six hospitals and every village nurse in Alaska within a period of 6 months. During his travels he personally rendered needed medical treatment to the natives in each village on his itinerary, and secured much valuable data with reference to health conditions among the natives and the medical work conducted by the Indian Office in Alaska.

On March 31, 1935, Dr. Murray was transferred from Alaska by the United States Public Health Service and severed his connection with the Office of Indian Affairs. His successor had not been selected at the close of the fiscal year.

The outstanding event of the year was the influenza epidemic, extending from Ketchikan, in southern Alaska, to Point Barrow, the northern tip of the continent. While this epidemic was not as virulent in character as that of 1918-19, the total number of deaths was probably more than 200, one village in southeastern Alaska having 40 deaths. Our public-health nurses, stationed in some 25 villages, rendered splendid service in treating cases, and the Territorial Public Health Service rendered fine cooperation and assistance in controlling the epidemic. The University of Pennsylvania Medical School sent two physicians to Alaska to collect specimens of sputum and virus for examination in connection with a scientific study of the disease.

The only expansion of the service was the appointment of two additional traveling nurses—one serving the Eskimo villages on the banks of the lower Kuskokwim River and the other serving villages on the Lower Yukon River.

No progress was made in securing new hospitals so badly needed, especially for the treatment of tuberculosis among the Indians and Eskimos. No further time should be lost in the construction of hospitals at Bethel on the Kuskokwim River and at Ketchikan, in southeastern Alaska. In addition, the need for hospital construction at Seward, Kanakanak, and Kotzebue continues urgent.

More dentists and nurses are sorely needed and should be authorized as soon as possible. Also we need additional funds for the hospitalization of Indians in private institutions.

With proceeds from the sale of Christmas seal stamps enough money was raised by the National Tuberculosis Association to initiate public-health measures against this disease in Alaska. Plans are under consideration now.

INDIAN LAND AND MINERALS—TRIBAL CLAIMS

New land as the first essential in rebuilding.—The task of consolidating lands checkerboarded through allotment, of salvaging the allotted heirship land, and of restoring to many tribes enough of balanced landholdings to make a permanent subsistence economy possible has been discussed in the two preceding annual reports. Perhaps nothing else in Indian need is so fundamental or so difficult. Land acquisitions are now going forward through submarginal grants, later mentioned in this report; through the land-purchase fund under the Indian Reorganization Act, elsewhere reported on; and through the use of tribal funds belonging to the Pueblo Indians, paid them in compensation for lands previously lost through Government dereliction. Some additional land purchases, it is hoped, will become possible through the hoped-for new rehabilitation project earlier mentioned.

Indian land acquisition differs in a significant way from the acquisition of land for such other uses as national forests, national parks, game refuges, and wilderness areas. The procurement of land for Indians is but an incident in the reconstruction of the individual and tribal economy of groups with the most varying backgrounds, situated among the most varying present conditions. Land acquisition, if unconnected with a feasible scheme of economic operation, is of little value to Indians, or of none at all. Indian initiative, and some amount of definite sacrifice by Indians, is quite essential if the land-acquisition program is to be humanly successful. Therefore the land program of the Indian Service interrelates itself with every other

service function and with the whole range of Indian life, and many other functions of the Indian Service are intimately linked with the land-acquisition program.

New Indian lands.—Under the act of June 14, 1934 (48 Stat. L. 960), 265,446 acres in Arizona have been added to the Navajo Reservation by purchase or exchange at a total cost of \$358,312. Seventeen tracts, totaling 52 acres, within the Pueblos of Picuris and Nambe have been acquired for \$6,355. Home sites for two members of the Capitan Grande Band of Mission Indians, and the Baron Long Ranch of about 1,600 acres to be occupied by about 80 members of the band, have been purchased for a total of \$129,600. A tract of 155 acres near Burns, Oreg., costing \$11,592, was acquired for the benefit of the Paiute or Snake Band living there. Under acts of Congress, 557 acres have been added to the Rocky Boy Reservation, Mont.; 8,300 to the Zuni Reservation, N. Mex.; and 75 acres of the former Whipple Barracks Military Reserve, Ariz., and 80 acres in Utah were withdrawn for the use of Indians.

Under the provisions of the National Industrial Recovery Act, approved June 16, 1933 (48 Stat. L. 195), the Indian Office has cooperated with the Federal Emergency Relief Administration in the purchase of land for the relief and benefit of the Indian population. During the year options were obtained on 1,655,384 acres, the asked price being \$6,585,219. Of this total, options on 1,070,169 acres have been accepted, at a cost of \$2,928,241. It is hoped that these purchases will be consummated under the direction and supervision of the Resettlement Administration, which has taken over the duties of the F. E. R. A. as to land purchases.

These lands are situated in the following States: Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Idaho, Oregon, and New Mexico. Options have also been secured on lands in Washington, California, Nevada, Utah, and Oklahoma.

Extension of trust periods.—The period of trust was extended for 10 years by order of the President on allotments made to Indians of the following tribes and bands: Torres Martinez, California; Crow, Montana; various tribes, Oklahoma; Klamath, Oregon; Crow Creek, South Dakota; Colville, Spokane, and Yakima, Washington.

Fee patents; sales.—Only 12 applications of Indians for patents in fee, covering 1,764 acres, were approved during the year. No new sales of restricted Indian lands have been made except a few in Oklahoma and on some reservations which voted not to accept the Indian Reorganization Act. The work of completing sales of allotted Indian lands made on the deferred-payment plan some years ago is progressing, final payments having been made on 67,520 acres.

Thirty-nine forced patents in fee previously issued without application were canceled under the acts of February 26, 1927 (44 Stat.

1247), and February 21, 1931 (46 Stat. 1205), bringing the number of such cancellations to 440. Suits have been instituted involving 75 allotments on which fee patents were canceled under the above-mentioned acts to cancel tax assessments, tax deeds, and sales, and to refund taxes paid by the Indians. In two recent cases of this kind judgments were recovered by the United States and all tax assessments, tax sales, and deeds were invalidated and taxes paid by Indians were recovered.

Five Civilized Tribes titles.—Forty-one suits were instituted to clear title to restricted lands belonging to allottees of the Five Civilized Tribes and 25 favorable judgments were obtained during the fiscal year. There are now pending about 50 suits involving the title to these lands belonging to restricted allottees.

Minerals.—There was considerable increase in the activity of leasing for oil and gas mining purposes in Oklahoma during the year. The income of the Osage Indians from their oil and gas leases was almost \$5,000,000, bringing the total received by them from that source to slightly more than \$252,700,000. Oil is being produced and marketed on the Navajo Reservation in New Mexico and on the Blackfeet Reservation, Mont.

There is little change in activities relative to lead and zinc mining at the Quapaw Agency, Okla., the Department having granted permission for suspension of mining operations on several of the leases.

Litigation.—Approximately 98 cases are now pending in the United States Court of Claims involving Indian tribal claims. Reports were made during the year to the Department of Justice on 19 of them. The court rendered decisions adverse to the Indian tribes in 7 cases. In one suit—*Blackfeet, Blood, etc., Tribes v. United States*, No. E-427—the Indians recovered a judgment for \$622,465.57. One case reached the Supreme Court of the United States—*United States v. Creek Nation*, No. F-205—in which the judgment of the Court of Claims in favor of the Creek Nation was reversed with directions for such further proceedings as might be necessary to bring the award of compensation into conformity with the Supreme Court's decision.

Litigation involving the Jackson Barnett estate is still being carried on, and in accordance with one decision the Riggs National Bank has turned over to the Secretary of the Interior in trust for the estate the sum of \$7,938.37 and securities of the aggregate face value of \$268,550. There are about 200 persons claiming to be Jackson Barnett's heirs.

Sixty-two reports were prepared on various bills introduced in the Seventy-fourth Congress, first session, relating to Indian tribal and individual claims, and 12 involving membership rights with various tribes.

Congress authorized an appropriation of \$79,002.19 to compensate individual Sioux Indians in connection with their claims for lost allotments adjudicated under the act of May 3, 1928 (45 Stat. L. 484).

INDIAN UNIT OF THE NATIONAL RESOURCES BOARD

As a part of the activities of the National Resources Board, a special Indian unit was formed, consisting in part of regular Indian Office personnel, and in part of employees hired especially for this work by the National Resources Board. An extensive survey was made of the present total Indian resources, and the attempt made to establish a standard by which the inadequacy of these resources might be measured. An estimate of the probable land and equipment needed in each reservation to enable the Indians to maintain a decent standard of living was set up.

An Indian land research unit was placed in the northern Pueblos jurisdiction to make an intensive study of the economic situation of the region in connection with the Soil Conservation Service. Maps were prepared of the Tewa Basin area showing the extent and type of erosion, type of vegetative cover, amounts of alienated agricultural land within present Pueblo grants, proposed improvements in land management, areas to be purchased for Indian use, and present Indian agricultural holdings in detail. Studies were made of the present economic status of the Tewa Indians, the present condition of Indian arts and crafts, health conditions, the effect of relief work on the economic and social balance, political organization, and the effect of community houses in improving Indian relationships with the outside world. In order to orient these studies properly in their setting, studies were also made of the surrounding Spanish-American villages, the sheep industry of New Mexico, and the effect upon the tax structure of the purchase of new lands for Indians. Recommendations were made as to more intelligent economic planning.

SOIL CONSERVATION

Soil conservation work, first instituted on the Navajo Reservation, has been extended to many reservations in cooperation with the Soil Conservation Service of the Department of Agriculture. In the Navajo and Pueblo areas, the perfect functional unification of the Indian Service and the Soil Conservation Service has been accomplished. The soil conservation work of the Indian emergency conservation work has been continued in Oklahoma, the Dakotas, Montana, and southern Arizona, as well as in the Pueblo and Navajo region.

Soil conservation operations are only in part engineering works. They include revegetation, range control, stock reduction, and, in the Navajo area, genetic work with a view toward the production of a Navajo type of sheep. The soil conservation interest has penetrated deeply into the curricula and project activities of many of the day schools, and of the Fort Wingate boarding school.

EMERGENCY CONSERVATION WORK

Emergency conservation work continued throughout the fiscal year 1935. The liberalized regulations which gave the Indian Service the supervision of this work on Indian reservations, including the disbursement of funds and employment of personnel, were also continued. Wholehearted cooperation has been given by the Department to all of our efforts, and Director Fechner has given sympathetic consideration to all requests made and has cordially cooperated in advancing the work.

A total of \$10,000,000 was allotted—\$7,500,000 under the appropriation in the act of March 31, 1933, and \$2,500,000 under the new act.

Enrollment and employment.—It is estimated that approximately 26,000 to 27,000 Indian enrollees have been employed since work began in 1933 through June 30, 1935.

The total average daily number of men on the pay roll during the past 2 years has been 9,763, a total of 2,751,964 calendar days. Some of the agencies staggered employment.

The number of supervisory jobs was kept under strict control. Indians were given preference and enrollees were taken over into them as rapidly as they could be trained. It was difficult to find Indians technically trained as foresters, engineers, etc., but a large number of group foremen, mechanics, machine operators, camp assistants, and assistant foremen have been Indians. The following table shows the number of Indians and non-Indians in supervisory and "facilitating" positions:

	Indians	Whites		Indians	Whites
July 1934.....	666	515	December.....	675	490
August.....	753	573	January 1935.....	649	483
September.....	771	593	February.....	598	472
October.....	709	513	March.....	581	406
November.....	752	516			

All work stopped after March 31, due to uncertainty as to the continuance of funds. Only skeleton crews were kept at work until definite instructions were given after the passage of the act of April 8.

Indians were permitted to work from camps or from their own homes. The cash allowance was \$30 per month, with quarters and

food in camp. If Indians lived at home and subsisted themselves, they were allowed commutation for quarters and rations in the sum of \$12 per month. Effective April 1, 1935, this allowance was increased to \$15 per month by Director Fechner, due to the increased cost of food supplies.

The family camp was encouraged wherever possible. This arrangement was advantageous to the Government and beneficial to the Indians. The concentration of the Indians in these camps permitted the regular employees of the Service to visit them frequently and to help them in sanitation and health problems, recreation, and other activities.

Health and accidents.—A few accidents were reported, some illness, and very few deaths. Special stress was placed upon safety. First-aid classes were held and a number of the Indians received certificates for completion of the course. As a general rule, the health of the Indians was tremendously benefited.

Production accomplishments.—A variety of work projects was undertaken on 78 reservations in 23 States. Soil erosion has long been recognized as one of the most destructive results of uncontrolled grazing, and plans were made for the development of water so as to distribute the use of forage more widely, and in the building of check dams and other structures to prevent the washing away of rich soil. While improvements of this nature are particularly necessary in Arizona, Colorado, Oklahoma, New Mexico, and Utah, there is urgent need for water development in all States lying between the Mississippi River and the Rocky Mountains.

A statement of the major activities undertaken during the period, July 1933 to March 31, 1935, follows:

Telephone lines-----	miles--	3, 489
Firebreaks-----	do----	1, 042
Truck trails-----	do----	3, 631
Horse trails-----	do----	999
Fences:		
Range-----	do----	3, 469
Other than range-----	do----	745
Springs and well development-----	units--	2, 444
Reservoirs-----	do----	1, 987
Insect-pest control:		
Tree-----	acres--	163, 013
Other-----	do----	342, 915
Rodent control-----	square miles--	9, 224
Check dams, erosion control-----	units--	52, 398
Bridges:		
Vehicle-----	do----	458
Stock-----	do----	175
Corrals-----	do----	107
Elimination of useless range stock-----	head--	242, 537

Indians have benefited in morale as well as in health. Reservation values have increased. Another important aspect: The production was definitely integrated with the developmental program for each reservation. Tribal authorities have planned with E. C. W. authorities, and passed upon projects wherever tribal organization existed.

Disbursements.—Of the sums disbursed by the Indian Emergency Conservation Work during the past 2-year period ending March 31, 1935, the pay roll (including shelter and subsistence, commutation thereof, or team hire and services) accounted for 71.8 percent. Purchases of heavy equipment accounted for 5.5 percent; while purchases of supplies for field work accounted for 13.2 percent. Of the total pay roll 87.3 percent went to Indian enrolled men or to Indian supervisors and skilled laborers. All but 18.7 percent of the total pay roll went to enrolled men. Purchases of equipment were kept to a minimum consistent with efficient work; however, the equipment definitely increased the amount of work that was accomplished.

Education.—While no formal educational program in the academic sense was offered, learning by doing was emphasized, and night classes were held on most of the reservations. The instructors were usually selected from among the supervisory personnel. Teachers from the regular Indian Service donated their time, as did State and county teachers in many instances. Technical employees at the various agencies willingly volunteered their services for instructional work.

During the next 2 years we plan to undertake a more extensive educational program, stressing particularly vocational activities. This will be similar to the training offered to C. C. C. enrollees in white camps, modified to meet the needs of each reservation.

Opportunities for leadership.—Training of Indians for leadership has been a major objective from the first, commensurate with competent performance and adequate work.

Our personnel set-up is so arranged that an Indian commencing as an enrollee at the minimum salary may, by application and industry, progress through various minor positions until he reaches the higher brackets, such as group foreman, and even project manager.

Savings accumulated.—The wages of Indians have been saved by withholding, in most instances, part of the earnings. Approximately \$1,180,000 has been deposited during the past 2 years as individual Indian money. Some of this, of course, has been withdrawn by Indians to meet their needs, but a substantial balance remains available for use by the Indians later on.

"Indians at Work."—This mimeographed semimonthly magazine has been in increasing demand, not only by Indians and Indian Service

personnel but also by schools, organizations, and individual friends of the Indians. We have been forced to increase the number issued to 12,000 to meet the demand.

FORESTRY

The activities of the Forestry Division were directed chiefly along three major lines. In each of these one of the most heart-warming features of the work was the steadily mounting interest which the Indians on almost all of the reservations have taken in range management and forestry.

In range management the Forestry Division has stressed three features during the past year: First it has tried to reduce the amount of livestock grazed on all ranges to their carrying capacities, conservatively estimated. Except on a few southwestern reservations where the livestock is almost entirely Indian owned, this goal has been well achieved. Second, it has helped the Extension Division in gradually replacing with Indian-owned livestock the white-owned livestock to which the bulk of most of the Indian reservations is now being leased. Third, it has tried to get the Indians to take an increased part in the decisions concerning the management of their range, while at the same time making sure that the technical phases of range management remain under technical supervision. The most serious obstacle to efficient range administration has been the lack of personnel both in the field and in the office, a lack which has made it impossible effectively to prevent trespass, and on many reservations has caused the granting of permits and payment to the Indians to lag months behind the actual use of the range.

The past year has seen the recommencement of activity on several large timber sales which had been dormant for a number of years. At present there are 28 active timber sales on Indian reservations on which the volume of timber cut during the past year amounted to approximately 223,000,000 board feet. There were also 12 timber sales on which no activity took place during 1935, but which have not been canceled.

We have definitely taken the position that no matter how good the excuses may seem, we will permit no more timber sales unless the buyer will practice the best silviculture we know. As a result of this policy we inaugurated a group selective logging system in a redwood sale on the Hoopa Valley Reservation, which perhaps represents the first real forestry in the redwood type since the ox-team days. On the Quinalt Reservation, with its huge hemlock stands, we have refused to permit a modification of one contract unless both the Indians and the contractor agree to a group selection sys-

tem in this beautiful timber type. With the resumption of timber cutting on the Nett Lake Reservation we are demanding varying kinds of selective cutting for the different timber types on that area. In addition to these timber sales we have also the Menominee operation, as well as a number of small timber-cutting operations for tribal sawmills.

The third important Forestry Division activity was fire protection. In spite of the very dry summer of 1934 we had only one serious fire on any Indian reservation, and that was on a reservation where there was no forestry force.

ROADS

The policy as to road construction and road improvements on Indian reservations, inaugurated with the obtaining of P. W. A. funds, has been continued during the fiscal year with the \$2,000,000 provided in the Emergency Appropriation Act of June 19, 1934. This amount was entirely inadequate for the road program and the widespread unemployment among the Indians. Road work is a very popular form of employment among the Indians and it is believed that an appropriation of \$4,000,000 along the lines of the Hayden-Cartwright Act should be provided annually to continue this activity on Indian reservations. It would serve two purposes: namely, (1) provide employment among the Indians; and (2) provide improved graveled roads so sorely needed on most of the reservations, more so now that the success of the day-school program is largely dependent on all-weather school-bus roads. The sum of \$4,000,000 annually is little enough for road improvements on approximately 200 reservations of some 50,000,000 acres of land in 22 States, particularly in view of the fact that road development on many of the reservations is just emerging from the horse-and-buggy stage.

More of the Indians are taking over the better positions formerly held by whites in road work. This includes those as instrumentmen and other engineering assistants. A number of young Indian men were given special courses at several Indian schools during the year in the repair and operation of tractors, graders, road builders, and the like. This is supplemented with actual experience on the construction job.

A summary of the road work accomplished during the year with the \$2,000,000 appropriation follows:

Number of miles of road constructed or reconstructed.....	1,120
Number of miles of road surfaced.....	348
Number of miles of road maintained.....	3,755
Number of school roads constructed or otherwise improved.....	227
Number of bridges constructed.....	196
Number of bridges repaired.....	173

Number of culverts constructed or installed.....	1,655
Total number of persons, whites and Indians, employed at one time....	10,367
Total number of different individual Indians employed.....	15,116
Total number of Indians employed in skilled positions.....	799
Total number of whites employed in skilled positions.....	509

IRRIGATION

Irrigation activities during the year included routine maintenance and operation work on 122 projects in the 11 Western States, together with domestic- and stock-water development in Arizona and New Mexico; also certain construction work in rehabilitation and improvement of existing irrigation projects with funds allotted by the Public Works Administration.

Surveys and studies show that the ultimate irrigation development on the various reservations is approximately 1,160,000 acres, of which some 730,000 acres are now provided with irrigation facilities. The construction of supplemental storage, however, is necessary in many instances to provide an adequate water supply for the 730,000 acres already under constructed works. The total of irrigation construction cost (as distinct from operation and maintenance cost) to date, including expenditures made as far back as 1867 on projects some of which have since been abandoned or completely rebuilt, amounts to approximately \$40,000,000, and the estimated cost of completing the various projects, involving rehabilitation, supplemental storage, development of additional water, and extension of irrigation and drainage works to serve the entire 1,160,000 acres adequately, would be \$60,000,000. This would make the total average irrigation construction cost on Indian reservations, including expenditures on work of no present value and the complete rehabilitation of all projects, slightly less than \$100 per acre. Plans have been formulated for the completion of this work over a 10-year period.

Regular maintenance and operation activities.—Funds available for maintenance and operation of the various projects during the year amounted to \$912,426.

Of this, \$52,810 was appropriated Treasury funds for water development; \$396,055 appropriated Treasury funds for irrigation; \$6,720 tribal funds for irrigation; and \$456,841 collections from irrigation projects. The irrigation maintenance and operation collections for the year amounted to approximately 53 percent of the total expenditures, which is an especially good showing considering the comparatively low-market value of agricultural products. Of the total irrigation expenditures of approximately \$859,000 during the year, \$39,000 was expended in connection with the power systems on the San Carlos, Ariz., and Flathead, Mont., projects, leaving a net

irrigation expenditure of \$820,000. This averages approximately \$1.12 per acre for the entire area of 730,000 acres under constructed works, or \$1.82 per acre for the approximately 450,000 acres actually in cultivation.

Gila River adjudication suit.—The consent decree in the so-called "Gila River adjudication suit" was entered in the Federal court for the district of Arizona on June 29, 1935. This decree defines the various rights in the waters of the Gila River from its source in New Mexico to its junction with the Salt River near Phoenix, Ariz. The entering of this decree is the culmination of some 10 years of litigation and negotiations in regard to the water rights along the Gila River. It provides a first priority for 35,000 acres of Indian lands in the Gila River Reservation, a second priority for 1,000 acres of Indian land in the San Carlos Reservation, and varying priorities from 1868 to 1924 for the privately owned lands in Arizona and New Mexico. It also provides a right for the United States to store in the San Carlos Reservoir 1,285,000 acre-feet with a date of priority of June 7, 1924.

Middle Rio Grande conservancy district.—The construction operations of the middle Rio Grande conservancy district of New Mexico have been practically completed, and an audit of the district's accounts is being made by the General Accounting Office preparatory to making final payment. Final surveys, while not entirely completed, indicate that the total area of pueblo lands that will be benefited by the works of the district will be 11,620 acres.

Public Works projects.—Funds allotted by the Public Works Administration during the fiscal 1934 totaled \$6,953,050, of which \$2,488,862 had been expended to June 30, 1934, leaving \$4,464,188 available for expenditure during the fiscal year 1935. Subsequent allotments amounting to \$116,855 were made, bringing the total available for the fiscal year 1935 to \$4,581,043 and the total of all allotments to \$7,069,905. The total expenditures from these funds during the year amounted to approximately \$3,600,000, leaving a balance of about \$1,000,000 available for expenditure during the fiscal year 1936.

The work being carried on with these funds is principally the rehabilitation of existing projects, supplemental storage development, extension of irrigation and drainage canals and subjugation or preparation of Indian lands for irrigation.

The major projects under way during the year were as follows:

San Carlos project, Arizona, extension of canals, laterals, electrical transmission lines, and installation of standby Diesel generating plant of 2,300 kilovolt-amperes capacity; Gila River Reservation, Ariz., subjugation of approximately 6,000 acres of Indian lands; Colorado River Reservation, Ariz., construction of drainage canals and installation of drainage pumping plant; Flathead project, Montana, construction of storage dam on Mission Creek and

extension of canals, laterals, and electrical distribution system; Wind River project, Wyoming, construction of storage dam on Little Wind River and extension and enlargement of canals and laterals; Pine River project, Southern Ute Reservation, Colo., rehabilitation and extension of canals and laterals; Wapato project, Yakima Reservation, Wash., repair of storm damage to diversion dam in the Yakima River and installation of drainage pumping plant; Lummi project, Washington, repair of flood damage; Walker River Reservation, Nev., construction of storage dam on Walker River; Fruitland project, Navajo Reservation, N. Mex., enlargement and extension of irrigation system; Hogback project, Navajo Reservation, N. Mex., betterment and extension of irrigation system; and miscellaneous work on some 20 other reservations and pueblos in Arizona, California, Idaho, Nevada, Montana, and New Mexico.

CONSTRUCTION

Funds available for the fiscal year 1935 for construction purposes have been expended in the construction of day schools, hospitals, heating, water, sewer, and power systems, and miscellaneous buildings. A number of projects were completed or nearing completion by June 30, 1935, and our reports indicate that our entire authorized building program will be completed by June 30, 1936.

The design of practically all structures except hospitals has been prepared by an architectural firm in New York, and that of most of our hospital buildings by a firm of Chicago architects, leaving the design of a number of smaller building projects and the majority of our heating, water-supply, sewage-disposal, and power plants, together with the quantity surveys and estimates, for preparation by the technical staff in the Washington office.

The field construction office established at Albuquerque, N. Mex., has not undergone any material change in the past year; but, due to the large number of projects and time limitations set up in the Northwest by climatic conditions, we have found it necessary to augment considerably both the technical and the clerical personnel at the office in Billings, Mont. This increase includes an additional mechanical engineer, responsible for supervision over operating personnel and maintenance and care of mechanical equipment. Construction work supervised by our central office located at Muskogee, Okla., has been more limited in scope and a number of the projects completed, and only a small addition to the technical force has been necessary.

PROBATE WORK

The office now maintains a master docket of probate cases, in which is recorded each case and application for rehearing, the date of receipt, status, and final decision. Inquiries regarding estates are now disposed of the same day as received without the necessity of consulting the files. The saving in time and expense is tremendous. Ability to serve better is practically doubled.

On May 31, 1935, the Secretary of the Interior promulgated the new regulations as drafted by the Probate Division. Many of the provisions had been put into practical use before that date. The results already more than compensate the effort. Examiners of inheritance are handling more cases, more efficiently. Many matters whose doubtfulness previously caused confusion are now controlled by fixed rules based on experience. Indian estates are receiving better and more prompt attention.

General instruction is being given to all Government employees who are required to prepare Indian wills. All wills must be submitted to this office for examination as to form. Critical study is made to prevent errors of description and the making of devises that cannot in law be given effect. Affidavits by the testator are required, giving the reasons for unusual devises or bequests. This procedure insures the approval of the will, insures the testator that his wishes will be carried out, prevents disputes, and eliminates applications for rehearing.

Evidencing this is the fact that while 2,092 cases were handled during the 1934 fiscal year, 2,516 were disposed of in the fiscal year 1935, with a strong possibility that an increased number will be handled during the coming year.

In all controverted cases the parties are now notified immediately upon decision, and aggrieved parties are required to move for rehearing within 60 days. This brings all possible errors to immediate attention, and prevents applications for rehearing after long lapses of time when a major part of the estate may have been disposed of. The initial work is considerable, but the ultimate saving in labor and expense brings a satisfaction that fully justifies it.

Cooperation between the field and the Washington office is complete. Improvements in practice developed by each examiner of inheritance are interchanged with all, to the end that the best accepted procedure be made available to the Indian, and that, insofar as possible it be made uniform.

We are trying to establish a closer and speedier contact with the probate attorneys of Oklahoma, who are now under the Solicitor and a part of the Probate Division. This effort, and the added work made necessary by the promulgation of the new rules, calls for the designation of an additional attorney. A few years ago there were 4 attorneys assigned to this division; there are now but 2.

REVIEW OF MAJOR LEGISLATION SINCE 1933

A brief review of important legislation passed since March 1933 includes the following:

Old gag laws repealed.—On May 21, 1934, twelve ancient sedition and gag statutes affecting Indians and Indian country were repealed upon the initiative

of the Department of the Interior. These were sections 2111, 2112, 2113, 2120, 2134, 2147, 2148, 2149, 2150, 2151, 2152, and 2153 of the United States Revised statutes.

The Johnson-O'Malley Act, which passed April 1934 authorizes the making of contracts with the States for services in education, health work, and social work.

The Wheeler-Howard (Indian Reorganization) Act, passed June 1934 was fully discussed in the 1934 report, and is here summarized briefly again on page 114. This act was amended in June 1935 (Public, No. 147) so as to provide that in referendums on the adoption of the act, a majority of the votes actually cast, instead of a majority of all eligible voters, should be decisive on condition that not fewer than 30 percent of the residents of the voting area go to the polls. Elections already held are also governed by the majority-vote rule. The same amendment affects all referendums or constitutions and charters under the act.

Land acts passed during the last 2 years include the following:

Act of May 31, 1933 (48 Stat. L., 108).—This is an act to authorize appropriations to pay in part the liability of the United States to Indian pueblos under the act of June 7, 1924 (43 Stat. L. 636), to non-Indian claimants on Indian pueblo grants whose claims were found by the Pueblo Lands Board to have been for property occupied in good faith.

Act of April 30, 1934 (48 Stats. 647).—This provides for the amendment of section 1 of the act of June 25, 1910 (36 Stats. L. 855), to the effect that no refund should be paid to defaulting purchasers of Indian lands. Heretofore a refund of all sums paid on the principal in excess of 25 percent was made to the purchaser.

The act of June 14, 1934 (48 Stat. 960), created a new boundary for the Navajo Indian Reservation in Arizona. The act also authorized exchanges of lands for consolidation purposes and authorized an appropriation to purchase other private holdings for the benefit of the Navajo Indians.

Act of June 15, 1934 (48 Stat. L., 965).—This is an act to provide for the enrollment of the members of the Menominee Tribe of Indians of Wisconsin. It authorized the preparation of a roll with the existing roll as a basis. The act further provided for certain procedure in enrollment matters before the Interior Department and in the courts where complaint was made as to errors in enrollment proceedings.

Act of June 18, 1934 (48 Stat. L., 979).—This act amends the Chippewa Jurisdictional Act of May 14, 1926 (44 Stat. L., 555), to designate the plaintiffs in the different suits filed in the Court of Claims to include all who are entitled to share in the final distribution of the permanent fund. This act contains certain safeguards to prevent enrollment of persons claiming to be Chippewa Indians of Minnesota but who are not entitled to rights with the tribe.

The act of June 26, 1934 (48 Stat. L., 1240), amends the act of June 19, 1930 (46 Stat. L., 788), providing for the sale of the remainder of the coal and asphalt deposit in the segregated mineral land of the Choctaw and Chickasaw Nations. This act provided for the sale of tracts of less than 960 acres where the smaller tract adjoined a developed tract on which active mining operations are being conducted and which is needed by the operator in further developing the existing mine.

The act of May 29, 1935 (Public, No. 83, 74th Cong.), transferred 168.44 acres from the Minnesota National Forest Reserve for an Indian village for the benefit of the Chippewa Indians.

The act of June 4, 1935 (Public, No. 89, 74th Cong.), authorized an appropriation of \$223,162.62 to pay the Chippewa Indians of Minnesota for swamp-lands in the White Earth Reservation awarded to the State of Minnesota by the Supreme Court of the United States.

The act of June 14, 1935 (Public, No. 135, 74th Cong.), authorizes an exchange of Seminole lands in Florida with the State of Florida.

The act of June 20, 1935 (Public, No. 156, 74th Cong.), transfer approximately 8,320 acres from the Cibola National Forest to the Zuni Indian Reservation.

The act of July 24, 1935 (Public, No. 217, 74th Cong.), amends the act of June 27, 1926 (44 Stat. L., 763) authorizing the creation of wild rice reserves for the benefit of the Indians of Minnesota.

Three important measures passed after the close of the fiscal year

The Chippewa Cooperative Marketing Act provides for a loan of \$100,000 from Chippewa tribal funds to finance the cooperative handling of Chippewa Indian products, including processing, packing, and marketing. The principal product to benefit this year will be the wild rice, of which hundreds of pounds are harvested by the Chippewa Indians each year. The cooperative marketing of wild rice will enable the Chippewas to retain for themselves a greater share of the very large spread between the growers' price and the price to the consumer.

Government offsets in Indian claims suits.—Section 2 of title 1 of the second deficiency act directed that all gratuitous expenditures for benefit of tribes or bands of Indians should be treated as offsets, and deducted from the gross total of Indian judgments in the Court of Claims. Gratuities expended prior to the date of the treaties or agreement are not to be treated as offsets, nor are the emergency expenditures subsequent to March 4, 1933; but expenditures for land purchased under the Indian Reorganization Act unfortunately are made into offsets. Various suits now pending or authorized are exempted from the language of section 2 of the deficiency bill.

The Arts and Crafts Act passed after the close of the fiscal year, on August 21. An arts and crafts board, to serve without compensation, will be charged with the task of developing and improving the products of Indian handicraft and art, to organize the producers, and to find wider markets for the improved product. The board will also have the power to design Government marks certifying that the article bearing this mark is a genuine Indian product, and to prosecute those who affix such a mark or use imitation labels on products that are not genuine Indian ware.

APPROPRIATIONS

A total of \$19,157,064 was appropriated by Congress from the Federal Treasury, which included \$2,000,000 for the construction of roads on Indian reservations under the Emergency Construction Act of June 18, 1934. The appropriation from trust funds of Indian tribes was reduced to \$1,426,915, a decrease of \$852,786 under the appropriation for 1934. For the fiscal year 1936 a total of \$29,038,065 has been provided, of which \$1,499,933 represents the appropriation from trust funds. This amount includes full restoration of the 15-percent pay cut applied to Federal employees. Also included in the 1936 appropriation are the amounts of \$2,500,000 for the establishment of a revolving fund for the purpose of making loans to Indian chartered corporations and \$1,000,000 for the acquisition of land, in accordance with the provisions of the Indian Reorganization Act of June 18, 1934. There follows a comparative statement showing appropriations for the Service for the last 4 years:

	1933	1934	1935	1936
General purposes.....	\$1,840,054.35	\$1,593,500.00	\$1,806,894	\$2,780,880
Industrial assistance.....	1,301,000.00	1,233,881.67	1,060,510	3,740,490
Irrigation and water development.....	457,824.00	599,614.00	450,665	1,321,652
Education.....	9,771,000.00	9,103,230.00	7,990,565	8,795,120
Conservation of health.....	3,508,800.00	3,281,800.00	3,264,595	3,849,620
Support of Indians.....	2,156,300.00	2,141,900.00	2,141,815	2,279,350
Miscellaneous (roads, annuities, etc.).....	31,020.00	31,020.00	42,020	771,020
Subtotals.....	19,065,998.35	17,984,945.67	16,757,064	23,538,132
Construction.....	1,654,100.00	711,600.00	400,000	
Roads.....	1,420,000.00	270,000.00	2,000,000	4,000,000
Total.....	22,140,098.35	18,966,545.67	19,157,064	27,538,132

Specific appropriations from tribal funds were made to supplement the foregoing Treasury appropriations as noted in the following tabulation:

	1933	1934	1935	1936
General purposes.....	\$126,300	\$390,501	\$100,000	\$9,153
Industrial assistance.....	45,000	188,000	35,000	151,000
Irrigation and water development.....	59,000	46,950	6,720	6,500
Education.....	803,000	708,600	599,550	389,580
Conservation of health.....	125,000	131,550	121,490	162,000
Support of Indians.....	1,032,380	789,100	564,155	781,700
Miscellaneous (roads, annuities, etc.).....	25,000	25,000		
Total.....	2,215,680	2,279,701	1,426,915	1,499,933

The appropriation for 1935 from all funds aggregated \$20,583,979. For 1936 this amount is increased by \$8,454,086, making the sum available for expenditure \$29,038,065. This amount does not include allotments from special funds for Indian emergency conservation work, public works, and other activities in the Indian Service associated with the National Industrial Recovery program.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among the absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial report of the Bureau of the Census do not agree with the statistics of the Indian Service.

Full census rolls were not submitted this year. Only rolls of the births and the deaths and all other additions and deductions were returned together with a roll giving the names that would have been added to the 1934 census roll if a new roll for 1935 had been compiled, thereby saving much time in the typing of the census rolls. The tabulation for each reservation was made in the field by the various agencies and assembled as a whole in the Indian Office. This year the census rolls cover the period from April 1, 1934, to January 1, 1935. The change in date was made in order that the work might be more evenly distributed throughout the year; hence, all population statistics are for 9 months.

The total estimated and enumerated number of Indians thus reported on January 1, 1935, was 330,861. This number consists of 235,270 Indians actually enumerated and 95,591 Indians taken from the earlier or special censuses and estimates based on records. The latter number will be considered hereafter as an estimate. (See tabular statement below.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on January 1, 1935, increased by 2,903 over the corresponding figure from April 1, 1934. This increase, however, includes 690 Indians at Quapaw Agency which were added, thereby making the actual increase 2,213 or 0.7 percent for the 9 months.

It is significant that 87.5 percent of the 235,270 enumerated Indians resided at Federal jurisdictions, while only 29,350 or 12.5 percent resided off the reservations.

Oklahoma has far more Indians than any other State. If the Five Civilized Tribes, Miami and Peoria Indians are included, the Indian population of Oklahoma is 95,942, or 29 percent of the aggregate Indian population. Arizona ranks second with 44,524, or 13.5 percent; followed by New Mexico with 35,157, or 10.6 percent; South Dakota with 26,996, or 8.2 percent; and California with 23,814, or 7.2 percent of the total. The other five States with over 10,000 Indian population are in the order named: Montana, Minnesota, Washington, Wisconsin, and North Dakota. The first 5 States represent 68.4 percent of the entire Indian population, while the 10 States with an Indian population of over 10,000 form 88.7 percent of the aggregate Indian population.

Of the enumerated population on January 1, 1935, the most important tribes numerically are the Navajo, Sioux, including the Assiniboin, and Chippewa, numbering 43,555, 34,917, and 25,702, respectively; while in 1930 the same tribes were 40,863, 33,168, and 23,647. The increase from April 1, 1930, to January 1, 1935, for the Navajo tribe being 2,692, or 6.6 percent; for the Chippewa tribe, 2,055, or 8.7 percent; and the Sioux, including the Assiniboin, 1,749, or 5.3 percent.

Formerly the Navajo Indians were under five separate jurisdictions. During the past year all Navajo jurisdictions were consolidated under one Navajo Agency.

This new set-up includes the following former agencies: The part of Hopi Agency occupied by the Navajo Indians and Leupp Agency, in Arizona; Southern Navajo Agency, in Arizona and New Mexico; Western Navajo Agency, in Arizona and Utah; Eastern Navajo and Northern Navajo Agencies, in New Mexico.

Effective July 22, 1935, the Pueblos were all combined under a central agency known as the United Pueblos Agency and will be so shown next year in table 2.

The Indian population not actually enumerated (termed an estimate) is 95,591, which is as follows:

California:

Tulare County Indians, and Indians on Rancheria and public domain allotments, on Apr. 1, 1930, Sacramento Agency----- 1, 735

Other Indians under Sacramento Agency but not enumerated on census rolls, 1930 estimate, Sacramento Agency----- 8, 761

California, Indian census May 16, 1933, not otherwise reported----- 4, 483

Michigan, 1927 census----- 1, 192

New York, 1932 estimate----- 4, 523

Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930):

Cherokee----- 40, 904

Chickasaw----- 4, 685

Choctaw----- 16, 641

Creek----- 8, 607

Seminole----- 1, 789

----- 72, 626

Quapaw Agency:

Miami Reservation, 1935 estimate----- 290

Peoria Reservation, 1935 estimate----- 400

Texas, 1931 special report----- 250

Washington (Taholah Agency), scattered bands, 1932 estimate----- 511

Wisconsin:

Rice Lake Band of Chippewas, special census, July 1930----- 221

Stockbridge Reservation, Keshena Agency, 1910 census----- 599

The Indian population in the 24 States and the District of Columbia in which there were no Federal agencies in 1930 was 10,456. Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2. See the 1933 annual report of the Secretary of the Interior, page 112, table 1.

TABLE 1.—Indian Population by Age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All ages-----	332, 397	170, 350	162, 047	25 to 29 years-----	23, 491	12, 127	11, 364
Under 5 years-----	46, 680	23, 447	23, 233	30 to 34 years-----	19, 309	10, 032	9, 277
Under 1 year-----	9, 296	4, 681	4, 615	35 to 44 years-----	33, 031	17, 285	15, 746
5 to 9 years-----	46, 736	23, 434	23, 302	45 to 54 years-----	25, 039	13, 403	11, 636
10 to 14 years-----	39, 456	20, 028	19, 428	55 to 64 years-----	16, 787	9, 178	7, 609
15 to 19 years-----	36, 219	18, 154	18, 065	65 to 74 years-----	10, 030	5, 257	4, 773
20 to 24 years-----	28, 843	14, 697	14, 146	75 and over-----	6, 327	3, 079	3, 248
				Unknown-----	449	229	220

Source: Bureau of the Census, Department of Commerce.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1930

NOTE.—Tulare County, Rancheria, and Public Domain Allotments under Sacramento Agency, Calif., formerly included in this table shown this year under estimates

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
	235, 270	120, 049	115, 221	290, 707	103, 182	97, 585	5, 153	2, 519	2, 634	29, 350	14, 348	15, 002
Arizona												
Colorado River Agency	44, 524	23, 003	21, 521	43, 120	22, 286	20, 834	242	106	136	1, 162	611	551
Colorado River Reservation	1, 159	636	523	641	353	288	29	20	9	459	263	226
Chemehuevi	727	394	333	576	311	265	23	17	6	128	66	62
Mojave	293	145	148	187	92	95	1	—	—	105	53	52
Other tribes	427	245	182	388	218	170	20	16	4	19	11	8
Fort Mojave Reservation	7	4	3	1	1	—	2	1	1	4	2	2
Other tribes	432	242	190	65	42	23	6	3	3	361	197	164
Mojave	428	241	187	65	42	23	6	3	3	357	196	161
Other tribes	4	1	3	—	—	—	—	—	—	4	1	3
Fort Apache Agency and Reservation (Apache)	2, 751	1, 440	1, 311	2, 704	1, 418	1, 286	9	5	4	38	17	21
Fort Yuma Agency, in California, and Cocopah Reservation (Cocopah)	30	19	11	30	19	11	—	—	—	—	—	—
Hopi Agency and Reservation (Hopi) ¹	2, 634	1, 367	1, 267	2, 532	1, 316	1, 216	15	7	8	87	44	43
Navajo Agency ²	21, 890	11, 276	10, 614	21, 835	11, 252	10, 583	42	20	22	13	4	9
Hopi Reservation (part of) (Navajo) ³	3, 468	1, 801	1, 667	3, 447	1, 795	1, 652	11	6	5	—	—	—
Leupp Reservation	1, 981	1, 017	1, 964	1, 978	1, 015	963	3	2	1	—	—	—
Navajo	1, 971	1, 013	958	1, 968	1, 011	957	3	2	1	—	—	—
Other tribes	10	4	6	10	4	6	—	—	—	—	—	—
Southern Navajo Reservation, see New Mexico (Navajo)	11, 703	6, 045	5, 658	11, 692	6, 042	5, 650	7	3	4	4	—	4
Western Navajo Reservation, see Utah ⁴	4, 748	2, 413	2, 335	4, 718	2, 400	2, 318	21	9	12	9	4	5
Navajo	4, 292	2, 169	2, 123	4, 288	2, 167	2, 121	—	—	—	4	2	2
Other tribes	456	244	212	430	233	197	21	9	12	5	2	3
Patule Agency, in Utah, and Kaibab Reservation (Patule)	91	52	39	84	48	36	2	2	—	5	2	3
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)	442	244	196	317	182	135	1	—	1	124	62	62

¹ See estimated statement of other Indians not enumerated, numbering 95,591.² The population of Tulare County Indians, Rancheria, and Public Domain Allotments under Sacramento Agency, California, has been transferred to the estimated population statement; hence, the decrease in Sacramento Agency.³ Part of Hopi Reservation occupied by the Navajo Tribe, transferred to the Navajo Agency, hence, the decrease in Hopi Agency.⁴ Part of Hopi Agency, Arizona; Leupp Agency, Arizona; Southern Navajo Agency, Arizona and New Mexico; Western Navajo Agency, Arizona and Utah; Eastern Navajo Agency and Northern Navajo Agency, New Mexico; were formerly separate jurisdictions but now all under the Navajo Agency.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1935—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arizona—Continued.												
Pima Agency.	0, 121	3, 140	2, 981	5, 866	3, 024	2, 842	119	36	83	136	80	56
Fort McDowell Reservation (Mojave-Apache)	201	112	89	177	90	78	7	2	5	17	11	6
Gila River Reservation	4, 666	2, 394	2, 302	2, 334	2, 334	2, 229	53	14	39	80	46	34
Pima.	4, 129	2, 118	2, 011	4, 093	2, 061	1, 942	49	14	35	77	43	34
Other tribes.	567	276	291	560	273	287	4		4	3		
Martopa Reservation (Papago) ⁶	175	95	80	175	95	80						
Salt River Reservation	1, 049	539	510	951	496	455	69	20	39	39	23	16
Pima.	1, 043	537	506	945	494	451	59	20	39	39	23	16
Other tribes.	6	2	4	6	2	4						
San Carlos Agency, and Reservation (Apache).	2, 858	1, 473	1, 385	2, 846	1, 405	1, 441	3	2	1	9	6	3
Sells Agency.	5, 900	3, 014	2, 886	5, 885	3, 006	2, 879	13	8	5	2	2	2
Gila Bend Reservation (Papago) ⁶	228	125	103	228	125	103						
Papago Reservation	5, 147	2, 614	2, 533	5, 132	2, 606	2, 526	13	8	5	2		2
Papago.	5, 137	2, 608	2, 529	5, 132	2, 606	2, 526	3	2	1	2		2
Pima.	10	6	4				10	6	4			
San Xavier Reservation (Papago) ⁶	525	275	250	525	275	250						
Truett Canyon Agency.	648	342	306	356	203	177	9	6	3	259	133	126
Havasupai Reservation (Havasupai)	201	111	90	199	109	90	1			1		
Hualapai Reservation (Walapai)	447	231	216	447	231	216	8			258	132	126
California.	8, 835	4, 525	4, 310	7, 202	3, 741	3, 461	36	19	17	1, 597	755	832
Fort Yuma Agency, see Arizona and Fort Yuma Reservation (Yuma).	820	425	395	749	388	361	4	2	2	67	35	32
Hoopa Valley Agency.	1, 955	966	989	1, 510	758	752	9	4	5	436	204	232
Hoopa Valley Reservation.	1, 545	757	788	1, 279	634	645	9	4	5	257	119	138
Hoopa.	562	297	265	502	258	234	9		5	51	25	26
Klamath.	983	460	523	777	366	411				206	94	112
Rancheria.	410	209	201	231	124	107				179	85	94
Bear River (Bear River)	23	13	10	19	11	8				4	2	2
Blue Lake (Blue Lake)	69	36	33	44	19	25				25	17	8
Crescent City (Smith River)	48	19	29							48	19	29
Eel River (Miami)	152	78	74	84	47	37				68	31	37
Smith River (Smith River)	118	63	55	74	34	37				34	16	18
Mission Agency.	2, 901	1, 541	1, 360	2, 062	1, 143	919	4	2	2	835	396	439
Augustine Reservation (Mission)	14	8	6			6				1		
Cabezon Reservation (Mission)	28	17	11	13	7	9				6	4	2
Cahuilla Reservation (Mission)	107	55	52	53	25	25				54	27	27
Camero Reservation (Mission)	133	69	64	115	58	57				17	10	7
Capitan Grande Reservation (Mission)	160	82	78	141	78	63	1			19	4	15

⁶ Includes Reservation Indians.

Indian Reservation (Mission)	33	16	17	30	15	17	3	2	1
Yuma Reservation (Mission)	219	122	97	138	81	56	81	40	1
La Palla Reservation (Mission)	3	2	1						
La Palla Reservation (Mission)	219	122	97	138	81	56	81	40	1
Los Coyotes Reservation (Mission)	86	50	36	71	45	26	15	5	1
Manzanita Reservation (Mission)	67	30	37	60	29	31	7	1	6
Mesa Grande Reservation (Mission)	219	122	97	147	86	61	70	35	5
Mission Creek Reservation (Mission)	21	10	11	13	118	6	2	1	1
Morongo Reservation (Mission)	297	160	137	197	118	79	100	42	38
Pala Reservation (Mission)	208	110	98	153	85	68	55	25	30
Palm Springs Reservation (Mission)	49	25	24	48	25	23	22	10	12
Palm Springs Reservation (Mission)	69	36	33	47	26	21	22	10	12
Pechanga Reservation (Mission)	217	108	109	103	56	47	114	52	62
Pechanga Reservation (Mission)	183	98	85	113	60	53	70	38	32
Rincon Reservation (Mission)	41	22	19	26	15	11	15	7	8
San Manuel Reservation (Mission)	9	4	5	9	4	5			
San Pascual Reservation (Mission)	50	31	19	24	14	10	26	17	9
Santa Rosa Reservation (Mission)	86	41	45	20	12	8	66	29	37
Santa Ynez Reservation (Mission)	238	127	111	195	107	88	42	20	22
Santa Ynez Reservation (Mission)	122	61	61	105	52	53	1	9	8
Soboba Reservation (Mission)	35	16	19	35	16	19			
Torres-Martinez Reservation (Mission)	199	117	82	179	106	73			
Torres-Martinez Reservation (Mission)	1, 582	804	778	1, 392	699	693	13	7	6
Sacramento Agency	137	81	56	88	49	39	11	6	5
Fort Bidwell Reservation	135	81	54	88	49	39	11	6	5
Paute	2								
Other tribes	2								
Fort Bidwell reserve and Public Domain Allotments.	428	208	220	333	162	171	95	46	49
Pit River	319	155	164	153	153	160	6	2	4
Other tribes	109	53	56	20	9	11	89	44	45
Round Valley Reservation	832	419	413	801	400	401	2	1	11
Maidu	191	103	88	190	102	88			
Pomo	151	71	80	143	65	78	2	1	1
Wailaki	213	97	116	290	90	110	13	7	6
Wintoon	120	63	57	116	62	54	4	1	3
Yuki	92	45	47	91	44	47	1	1	1
Other tribes	65	40	25	61	37	24	4	3	1
Tule River Reservation	185	96	89	170	88	82	15	8	7
Pankahachi	41	22	19	34	20	14	7	2	5
Yawilmani	83	42	41	75	36	39	8	6	2
Other tribes	61	32	29	61	32	29			
Walker River Agency, in Nevada, and Fort Independence and Indian Ranch Reservations, homestead tracts, and Bishop scattered bands.	1, 577	789	798	1, 489	753	736	6	4	2
Paute	1, 351	678	673	1, 268	644	624	6	2	3
Other tribes	226	111	115	221	109	112	5	2	

The population of Tulare County Indians' Rancheria, and Public Domain Allotments under Sacramento Agency, California, has been transferred to the estimated population

²The population of Tulare County Indians' Rancheria, and Public Domain Allotments under Sacramento Agency, California, has been transferred to the estimated population statement; hence, the decrease in Sacramento Agency.

• Maricopa Reservation formerly erroneously returned as Chui-Chuischu Reservation.

• Apr. 1, 1934, population.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1935—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Colorado												
Consolidated Ute Agency, see Utah	835	425	410	833	419	404	8	3	5	4	3	1
Southern Ute Reservation (Ute)	835	425	410	823	419	404	8	3	5	4	3	1
Ute Mountain Reservation (Ute)	384	193	191	384	187	187	6	3	3	2	1	1
Florida: Seminole Agency and Reservation (Seminole)	451	232	219	447	230	217	2	2	2	2	2	2
Idaho												
Coeur d'Alene Agency, see Washington	574	285	289	574	285	289						
Coeur d'Alene Reservation	2,154	2,937	2,108	3,557	1,761	1,796	171	69	72	467	227	240
Coeur d'Alene	627	303	324	1,751	825	826	115	67	48	288	134	154
Coeur d'Alene	625	301	324	440	213	227	14	9	5	173	81	92
Cree	2	2		438	211	227	14	9	5	173	81	92
Kootenai Reservation (Kootenai)	120	61	59	106	55	51				14	6	8
Nez Perce Reservation (Nez Perce)	1,407	662	745	1,205	557	648	101	58	43	101	47	54
Fort Hall Agency and Reservation, see Utah	1,841	953	888	1,635	837	798	40	24	16	176	92	84
Bannock	350	176	174	127	138	140	12	6	6	60	32	28
Shoshone	1,488	777	711	1,344	699	645	28	18	10	116	60	56
Other tribes	3	3		3		3						
Western Shoshone Agency and Reservation, in Nevada												
Payute	200	108	92	181	99	82	16	8	8	3	1	2
Shoshone	122	68	54	106	61	45	15	7	8	1		1
Washo-Paiute	77	39	38	74	37	37	1	1		2		
Iowa: Sac and Fox Sanatorium Jurisdiction and Reservation (Sac and Fox of the Mississippi)												
Kansas												
Potawatomi Agency	427	215	212	386	196	190	25	9	16	16	10	6
Iowa Reservation (Iowa)	1,912	983	929	1,511	796	715	202	98	104	199	89	110
Kickapoo Reservation (Kickapoo)	505	271	234	477	253	219	3	1	2	25	12	13
Potawatomi Reservation (Potawatomi)	316	161	155	260	138	122	23	13	10	35	10	23
Sac and Fox Reservation (Sac and Fox of the Missouri)	990	506	484	703	367	336	154	75	79	133	64	69
Minnesota												
Consolidated Chippewa Agency	101	45	56	71	33	38	22	9	13	8	3	5
Bois Forte Reservation (Chippewa)	15,352	7,737	7,615	10,950	5,654	5,296	430	204	226	4,002	1,879	2,123
Cass Lake and Winnibigoshish Reservations (Chippewa)	12,837	6,428	6,409	8,970	4,678	4,292	394	188	206	3,473	1,612	1,861
Fond du Lac Reservation (Chippewa)	636	304	332	428	208	220				208	96	112
Grand Portage Reservation (Chippewa)	520	266	254	472	248	224	14	8	6	34	10	24
Leach Lake Reservation (Chippewa)	1,303	689	614	706	381	325	11	4	7	586	304	282
White Earth Reservation (Chippewa)	274	165	219	126	148	148				110	39	71
	897	454	443	803	410	393	44	19	25	50	25	25
	8,171	4,061	4,110	5,464	2,816	2,648	324	166	168	2,383	1,089	1,294

	567	306	291	504	276	228	1	1	62	20	33
White Oak Point Reservation (Chippewa)	350	183	176	319	163	156			40	20	20
Pipestone School Jurisdiction and Purchased Lands (Sioux)	553	279	274	148	76	72	1	1	404	203	201
Red Lake Agency and Reservation (Chippewa)	1,992	1,030	902	1,532	950	882	35	16	125	64	61
Mississippi: Choctaw Agency and Purchased Lands (Choctaw)	1,799	913	886	1,791	908	883	8	5			
Montana	15,418	7,871	7,547	13,162	6,792	6,370	455	247	1,801	832	869
Blackfeet Agency and Reservation ^e	3,962	2,031	1,931	3,401	1,765	1,636	36	19	1,525	247	278
Other tribes	3,946	2,028	1,918	3,396	1,763	1,633	36	19	514	246	268
Crow Agency and Reservation (Crow)	16	3	13	5	2	3				1	10
Flathead Agency and Reservation (Flathead)	2,112	1,062	1,050	1,874	951	923	27	8	211	103	108
Fort Belknap Agency and Reservation	2,999	1,527	1,472	2,305	1,206	1,099	112	66	46	552	327
Fort Peck Agency and Reservation	1,400	729	671	1,273	661	612	34	25	93	43	50
Assiniboin	688	343	315	610	315	295	14	9	5	15	3
Gros Ventre	738	383	355	659	343	316	20	16	59	24	35
Other tribes	4	3	1	4	3	1					
Fort Peck Agency and Reservation	2,707	1,356	1,351	2,295	1,164	1,131	141	70	271	122	149
Assiniboin	1,490	759	731	1,260	653	607	67	35	163	71	92
Sioux	1,217	597	620	1,035	524	511	74	35	108	51	57
Rocky Boy's Agency and Reservation	367	330	330	550	298	262	49	28	98	51	47
Chippewa	467	240	227	355	181	174	38	20	74	39	35
Cree	186	95	91	160	80	80	10	7	16	8	8
Other tribes	44	32	12	35	27	8	1	1	8	4	4
Tongue River Agency and Reservation	1,541	799	742	1,464	757	707	56	31	25	11	10
Cheyenne	1,538	796	742	1,461	754	707	56	31	21	11	10
Other tribes	3	3		3							
Nebraska	4,501	2,338	2,163	3,165	1,632	1,533	330	173	1,006	533	473
Winnebago Agency	4,501	2,338	2,163	3,165	1,632	1,533	330	173	1,006	533	473
Omaha Reservation (Omaha)	1,639	866	773	1,361	715	646	34	19	244	132	112
Ponca Reservation (Ponca)	391	189	202	196	96	100	9	3	186	90	96
Santee Reservation (Santee)	1,272	662	610	737	374	363	206	106	100	329	182
Winnebago Reservation (Winnebago)	1,199	621	570	871	447	424	81	45	36	247	129
Nevada	5,054	2,535	2,549	4,874	2,439	2,435	181	82	29	14	15
Carson School Jurisdiction	2,642	1,282	1,360	2,575	1,255	1,320	64	24	40	3	
Fort McDermitt Reservation (Paute)	269	124	145	249	119	130	20	5			
Pyramid Lake Reservation	548	270	278	648	270	278					
Paute	545	270	275	645	270	275					
Other tribes	3		3	3		3					
Summit Lake Reservation (Paute)	64	34	30	64	34	30					
Public Domain	1,761	854	907	1,714	832	882	44	19	3	3	
Eel River	1		1								
Paute	264	113	151	261	111	150	2	1	1	1	
Shoshone	926	445	481	924	445	479	2	2			
Washo	570	296	274	528	276	252	40	18	2	2	
Paute Agency, in Utah	194	97	97	182	92	90			12	5	7
Moapa River Reservation (Paute)	155	80	75	146	76	70			9	4	5
Las Vegas Tract (Paute)	39	17	22	36	16	20			3	1	2

^e Apr. 1, 1834, population.[†] Formerly Potawatomi Agency returned under Haskell Institute as a subagency.

TALBE 2.—*Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1935*—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nevada —Continued.												
Walker River Agency, see California												
Fallon Reservation	1,714	874	840	1,664	851	813	43	20	23	7	3	4
Paute	423	216	207	409	209	200	12	6	6	2	1	1
Shoshone	419	215	204	405	208	197	12	6	6	2	1	1
Mason and Smith Valleys	4	1	3	4	1	3						
Shoshone	437	227	210	419	219	200	18	8	10			
Paute	428	221	207	410	213	197	18	8	10			
Other tribes	9	6	3	9	6	3						
Nye County Scattered Indians	363	183	180	363	183	180						
Paute	29	16	13	29	16	13						
Shoshone	334	167	167	334	167	167						
Walker River Reservation	491	248	243	473	240	233	13	6	7	5	2	3
Paute	444	224	220	426	216	210	13	6	7	5	2	3
Shoshone	47	24	23	47	24	23						
Western Shoshone Agency and Reservation, see Idaho												
Shoshone	534	282	252	453	241	212	74	38	36	7	3	4
Other tribes	410	228	212	371	194	177	67	33	34	2	1	1
Other tribes	94	54	40	82	47	35	7	5	2	5	2	3
New Mexico												
Jicarilla Agency and Reservation (Apache)	35,157	18,252	16,332	34,569	17,899	16,670	117	52	65	471	274	197
Mescalero Agency and Reservation (Apache)	687	335	318	678	345	333	7	6	5	2	1	1
Navajo Agency	729	361	368	714	349	366	6	5	1	9	8	1
Eastern Navajo Reservation (Navajo)	21,830	11,086	10,744	21,823	11,080	10,743	5	5		2	1	1
Northern Navajo Reservation (Navajo)	8,394	4,188	4,206	8,391	4,188	4,206						
Southern Navajo Reservation (Navajo)	8,328	4,452	4,076	8,525	4,449	4,076						
Santa Fe School Jurisdiction, in Arizona (Navajo)	4,908	2,416	2,462	4,904	2,403	2,401	60	21	39	55	35	20
Nambe Pueblo (Pueblo)	2,258	1,152	1,106	2,143	1,096	1,047	2	2	2	4	2	2
Picuris Pueblo (Pueblo)	127	60	67	119	56	63	4	2	2	4	2	2
Pueblo Pueblo (Pueblo)	115	54	61	109	52	57	2	2	2	2	2	2
Pojoaque Pueblo (Pueblo)	7	5	2	5	3	2						
San Ildefonso Pueblo (Pueblo)	127	69	58	113	64	49	9	2	7	5	3	2
San Juan Pueblo (Pueblo)	578	291	287	539	269	270	24	9	15	15	13	2
Santa Clara Pueblo (Pueblo)	417	212	205	392	196	196	13	6	7	12	10	2
Taos Pueblo (Pueblo)	763	397	366	742	392	350	8	2	6	13	3	10
Tesuque Pueblo (Pueblo)	124	64	60	124	64	60						
Southern Pueblos Agency												
Acoma Pueblo (Pueblo)	7,590	4,104	3,486	7,179	3,855	3,294	28	6	22	353	213	170
Cochiti Pueblo (Pueblo)	1,130	592	538	1,092	557	533	58	33	25	58	33	25
	309	169	140	305	157	138	4	2	2	4	2	2

	1,104	604	500	1,079	585	493			25	18	7
Isleta Pueblo. -----	3	3									
Navajo-Pueblo.			500	1,079	586	493			3	3	
Pueblo.	1,101	601	500						22	15	7
Jemez Pueblo (Pueblo).	353	353	301	646	348	298			8	5	3
Laguna Pueblo (Pueblo).	2,288	1,195	1,093	2,000	1,052	948	27	6	261	137	124
Sandia Pueblo (Pueblo).	121	65	66	110	58	52			11	7	4
San Felipe Pueblo (Pueblo).	603	335	288	506	331	265	1	1	6	4	2
San Juan Pueblo (Pueblo).	242	146	96	242	146	96					
Santa Ana Pueblo (Pueblo).	923	537	386	916	532	384					
Santo Domingo Pueblo (Pueblo).	196	108	88	193	106	87			7	5	2
Sia Pueblo (Pueblo).	2,063	1,170	893	2,032	1,145	887	11	9	20	16	4
Zuni Agency and Pueblo.	2,055	1,170	885	2,026	1,145	881	10	9	19	16	3
Pueblo.									1	1	1
Other tribes.	8		8	6		6					
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee). -----	3,220	1,708	1,512	2,250	1,212	1,038			970	496	474
North Dakota.	10,465	5,314	5,151	6,805	3,479	3,326	159	82	3,501	1,753	1,748
Fort Berthold Agency and Reservation.	1,595	788	807	1,531	754	777	15	10	5	24	25
Arrikara.	567	273	294	533	258	275	5	1	29	14	15
Gros Ventre.	702	348	354	682	337	345	4	3	1	8	8
Mandan.	325	167	159	316	159	157	6	6	4	2	2
Fort Totten Agency and Devils Lake Reservation (Sioux). -----	986	504	482	904	466	438	38	18	20	44	24
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux). ^a	47	29	18	47	29	18					
Standing Rock Agency and Reservation, see South Dakota (Sioux).											
Turtle Mountain Agency and Reservation (Chippewa).	1,095	844	851	1,539	770	769	52	26	104	48	56
Oklahoma.	6,142	3,149	2,993	2,784	1,460	1,324	54	28	3,364	1,661	1,643
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho).	22,626	11,366	11,260	16,831	8,502	8,329	714	354	5,081	2,510	2,571
Kiowa Agency.											
Kiowa Reservation.	2,786	1,439	1,347	2,465	1,260	1,205	137	74	184	105	79
Apache.	6,061	2,958	2,103	5,924	2,888	2,636	28	18	109	52	57
Comanche.	4,624	2,264	2,360	4,566	2,226	2,330	13	6	45	22	23
Kiowa.	324	171	153	322	169	153	1	1		1	
Wichita.	2,130	1,043	1,087	2,103	1,032	1,071	3	3	24	11	13
Wichita Reservation.	2,170	1,050	1,120	2,141	1,035	1,076	9	5	20	10	10
Caddo.	1,437	694	743	1,358	652	706	15	12	3	64	34
Delaware.	928	456	472	865	423	442	10	8	2	25	28
Wichita.	143	76	76	143	67	78					
Osage Agency and Reservation (Osage). -----	366	171	165	350	162	188	5	4	11	5	6
Pawnee Agency.	3,855	1,829	1,758	1,958	1,047	941	5	2	1,592	780	812
Kaw Reservation (Kaw).	3,017	1,527	1,490	2,390	1,223	1,167	195	97	432	207	225
Oakland Reservation (Tonkawa).	510	266	244	292	155	137	44	23	174	90	84
Otoe Reservation (Otoe).	47	26	21	36	20	16			7	3	4
Pawnee Reservation (Pawnee).	727	374	353	555	286	209	68	34	104	54	50
Ponca Reservation (Ponca).	921	459	462	746	361	381	43	18	132	76	76
	812	402	410	761	377	384	36	21	15	4	11

^a Part of Hopi Agency, Arizona; Leupp Agency, Arizona and New Mexico; Western Navajo Agency, Arizona and Utah; Eastern Navajo Agency and Northern Navajo Agency, New Mexico, were formerly separate jurisdictions but now all under the Navajo Agency.

^b Apr. 1, 1934, population.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1935—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Quapaw Agency	2,607	1,276	1,331	1,416	708	708	261	124	137	930	444	486
Eastern Shawnee Reservation (Shawnee)	265	122	143	167	81	86	25	15	11	72	26	46
Ottawa Reservation (Ottawa)	395	209	186	216	112	104	21	11	10	158	86	72
Quapaw Reservation (Quapaw)	528	233	275	329	160	169	16	9	7	173	84	99
Seneca Reservation (Seneca)	704	345	359	395	191	191	131	60	71	178	94	84
Wyandotte Reservation (Wyandotte)	715	337	368	309	164	145	67	29	38	339	164	185
Shawnee Agency	4,570	2,337	2,233	2,648	1,376	1,272	88	39	49	1,854	922	912
Iowa Reservation (Iowa)	109	53	56	108	53	55				1		1
Kickapoo Reservation (Kickapoo)	289	140	149	251	135	116				8		3
Potawatomi Reservation (Potawatomi)	2,727	1,389	1,338	966	495	471	59	26	33	1,702	868	834
Sac and Fox Reservation (Sac and Fox)	849	425	424	733	383	350	14	5	9	1,02	37	65
Shawnee Reservation (Shawnee)	626	330	296	590	310	280	15	8	7	21	12	9
Oregon	4,674	2,290	2,384	3,537	1,782	1,755	513	166	147	824	342	482
Klamath Agency and Reservation	1,370	670	700	1,063	538	525	31	28	23	256	104	152
Klamath	802	415	387	640	324	316	7	4	4	155	59	96
Modoc	313	153	160	231	112	119	27	14	13	55	27	28
Paiute	142	73	69	113	59	54	17	10	7	12	4	8
Pit River	106	53	53	79	43	36				27	10	17
Shasta	7	4	3							7	4	3
Salem School Jurisdiction	1,152	598	554	873	469	404	47	30	17	232	99	133
Grande Ronde Reservation	351	187	164	216	124	92	29	18	11	106	45	61
Clackamas	84	40	44	48	25	23	10	6	4	26	9	17
Rogue River	56	33	23	35	20	15	7	5	2	14	8	6
Umpqua	60	27	33	37	18	19				23	9	14
Other tribes	151	87	64	96	61	35	12	7	5	43	19	24
Shetaz Reservation	474	239	235	365	187	178	10	5	5	99	47	52
Chastacosta	32	12	20	27	11	16				6	1	4
Galice Creek	42	22	20	38	19	19		1		3	2	16
Joshua	43	22	21	14	9	5	1	1		28	12	1
Klamath	55	34	21	42	27	15				13	7	9
Meguendon	53	26	27	39	18	21				14	8	6
Rogue River	49	28	21	42	23	19	1	1		6	4	2
Tututni	44	16	28	41	15	26				3	1	2
Other tribes	156	79	77	122	65	57	7	2	5	27	12	15
Fourth Section Allottees (Public Domain)	327	172	155	292	158	134	8	7	1	27	7	20
Cherokee	18	12	6		12	6						
Klamath	51	25	26	39	20	19	3	3		9	2	7

Tulalip Reservation and Tulalip unattached Indians										
664	321	343	459	222	237	2	---	2	203	99
655	316	339	450	217	223	2	---	2	203	99
9	5	4	9	5	4	---	---	---	754	383
Other tribes										
763	399	364	9	6	3	---	---	---	13	6
234	124	110	221	118	103	---	---	---	3	1
207	116	91	200	113	87	---	---	---	26	239
2, 395	1, 372	1, 523	2, 369	1, 135	1, 244	43	2	26	483	253
11, 493	5, 744	5, 659	9, 251	4, 698	4, 553	395	181	214	1, 757	892
Wisconsin										
Keshena Agency and Menominee Reservation (Menominee)*										
2, 112	1, 070	1, 042	1, 998	1, 025	973	14	5	9	100	40
4, 687	2, 372	2, 315	3, 786	1, 906	1, 880	74	45	29	827	421
1, 217	653	584	738	358	350	25	16	9	454	229
1, 570	778	792	1, 437	707	730	28	14	14	105	57
869	412	457	757	358	399	---	---	---	112	54
608	320	288	454	239	215	---	---	---	148	77
423	230	194	400	214	186	6	4	2	148	77
4, 604	2, 302	2, 302	3, 467	1, 767	1, 760	15	11	4	8	4
3, 172	1, 557	1, 575	2, 554	1, 167	1, 087	307	131	176	830	404
1, 432	705	727	1, 213	600	613	173	72	101	745	358
2, 203	1, 119	1, 054	1, 979	1, 018	961	134	59	75	85	46
Wyoming										
Shoshone Agency and Wind River or Shoshone Reservation										
2, 203	1, 119	1, 084	1, 979	1, 018	961	57	29	28	167	72
1, 091	557	534	1, 051	538	513	15	9	6	25	10
1, 112	562	550	928	480	448	42	20	22	142	62

* Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Lac du Flambeau Agency. (See estimated statement.)
 † Oneida Reservation, formerly under Keshena Agency, but now under Tomah School Jurisdiction, hence, the marked change in population.

TABLE 3.—Indian school population and school enrollment during fiscal year ended June 30, 1935

State and jurisdiction	Indian children, 6 to 18	Enrollment								Definite information not available	Not enrolled in any school	Not eligible for enrollment	Under 6 years and over 18 years in all schools
		Total number	Public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatoria				
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Total		80,434	48,522	9,505	8,631	5,125	2,162	5,998	491	4,974	14,540	1,452	2,180
Arizona		8,039	686	2,792	1,882	1,054	802	742	81	680	4,587	121	373
Colorado River:													
Chemehuevi		66	43		14	9		4		7	4		7
Mohave		193	125	16	13	37		26			167	41	13
Fort Apache		916	759	5	431	12	95		1		36	11	10
Hopi: Hopi		661	659	27	7	95		24				5	34
Kaibab (under Paintne)		24	1	19		4						2	5
Navajo:													
Leupp		385	430	23	336	46		3	8				45
Navajo (formerly under Hopi)		199	217		161	56							18
Southern Navajo		4,422	1,732	315	418	382		446			2,735		105
Western Navajo		1,771	439	44	344	41			3		1,312		34
Phoenix: Camp Verde		1,114	76	47	5	24				30	12	10	4
Pima		1,298	1,218	58	740	130	149	72	69	115	37	8	72
Salt River		412	329	190		88		14		22	83		23
San Carlos		770	579	295	62	25	141	42	42	506	192	46	2
Sells		1,593	1,063	389		90	416	111					
Truxton Canon:													
Havasupai		53	52	37		15					1		1
Hualapai		124	121	29	91		1					3	
California		4,788	4,481	3,680	46	550	117	61	15	142	361	79	139
Bishop (under Walker River, Nev.)		449	327	12	43			1		77	122	28	
Fort Yuma		189	196		3		114		1		11	8	18
Hoopa Valley		1,192	1,152	1,034		118				3	29	8	
Mission		738	692	553		96	3	40		19	79	6	33
Sacramento		2,190	2,114	1,794		286		20	14	43	120	29	87
Colorado: Consolidated Ute		231	159	74	64	19		2		2	72	26	
Florida: Seminole		181	48								105		32
Idaho		1,086	866	564	87	42	1	107	65	127	106	31	13
Coeur d'Alene		185	189	84		3		70	2	25	12	1	
Nez Perce		412	312	217	6	26		26	63	14	14		
Fort Hall		489	395	263	87	33	1	11		16	90	31	12
Iowa: Sac and Fox		126	78	21	46	9			2	17	36	1	5

	603	436	403				1	2	149	32	7	26
Kansas												
Sac and Fox	23	13	10						9	1	1	1
Potawatomi	275	225	205				1	1	42	12	5	16
Iowa	175	92	87						71	16	1	4
Kickapoo	130	106	101						27	3		6
Minnesota												
4,512	4,150	3,094	119				383	19	180	242	68	60
Consolidated Chippewa	3,811	3,537	2,776	72			275	15	180	130	44	36
Pipestone	72	70	55							2		
Red Lake	629	543	263	119			108	3		110	24	24
Mississippi: Choctaw												
5,016	4,733	3,279	423				359	10	99	164	12	144
Montana												
Blackfeet	1,343	1,200	669	176			73			410	135	
Crow	633	589	552	371			94			143		
Flathead	982	874	647				11			62	38	18
Fort Belknap	466	446	405				37		8	124	40	24
Fort Peck	785	906	746				25		26	10	8	6
Rocky Boys	300	358	140	186			12			32	25	81
Tongue River	447	360	120	71			82		65	37	2	15
Nebraska												
1,437	1,415	1,190	66				165	17	19	5	3	
Winnipegago:												
Winnebago	385	322	8				47	8				
Omaha	526	521	24				40	7	2	5	3	
Santee	396	379	2				57	1	17			
Ponca	130	130	7				21					
Nevada												
1,594	1,225	614	42				2	12	151	303	40	40
Carson	1,789	601	333	287					74	137	13	23
Pyramid Lake	150	124	19	79					12	20	1	6
Moapa River (under Paiute, Utah)	37	26	11									
Walker River:												
Fallon	106	78	33						16	13	2	1
Walker River	109	80	5	22					12	17	5	
Mason-Smith Valleys	111	59	19	4			1		17	52	6	
Scattered Indians	96	63	56	7					18	33	2	
Western Shoshone	196	183	123	3			1	12	2	23	10	10
New Mexico												
9,271	5,115	146	1,966	1,204			503	51	13	4,581	92	232
Jicarilla	172	165	9				90	51	3	14	9	7
Mescalero	206	189	18	13			1			30	6	13
Navajo:												
Eastern Navajo	2,775	888	50	23			121			2,108		21
Northern Navajo	3,172	1,118		278			60			2,086		32
Southern Pueblos	631	645	8	427			63			40		54
Southern Pueblos	1,764	1,598	54	889			166		10	232	51	73
Zuni	551	512	7	201			2			71	26	32
North Carolina: Cherokee												
1,230	865	272	322	260				1	377	29	17	41
North Dakota												
3,983	3,207	1,559	682	221			497	13	393	511	139	117
Fort Berthold	442	415	222	105			53		23	21	12	8
Fort Totten	231	215	78	22			90		3	40	38	24
Standing Rock	1,088	813	619				39	8	110	203	69	38
Turtle Mountain	2,222	1,764	640	555			294	2	258	247	20	47

1934 data.

TABLE 3.—Indian school population and school enrollment during fiscal year ended June 30, 1935—Continued

State and jurisdiction	Indian children, 6 to 18	Enrollment							Definite information not available	Not enrolled in any school	Not eligible for enrollment	Under 6 years and over 18 years in all schools
		Total number	Local public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatoria			
Oklahoma.	2	30,718	25,898	256	2,778	447	219	1,174	16	1,156	137	350
Cheyenne and Arapaho	37,369	416	175	---	---	34	---	3	---	69	26	55
Kiowa	1,930	1,594	994	---	424	94	61	14	7	321	18	92
Osage	1,334	1,020	761	---	---	---	129	130	---	294	59	59
Pawnee:												
Kav	176	119	107	---	7	5	---	---	---	56	6	5
Pawnee	276	238	163	---	53	21	---	---	1	40	3	25
Ponca	260	234	147	---	69	13	2	3	---	22	2	16
Otoe	248	184	126	---	48	10	---	---	---	53	6	1
Tonkawa	18	14	9	---	---	4	---	---	---	4	---	1
Quepaw	868	677	601	---	52	20	4	---	---	202	8	27
Shawnee	1,123	1,021	863	---	3	43	23	81	8	86	15	63
Five Civilized Tribes	30,590	25,201	21,882	256	1,917	203	71	943	---	---	---	---
Cherokee Nation	12,992	10,616	9,369	153	790	71	12	233	---	---	---	---
Chickasaw	3,546	2,678	2,421	40	182	21	---	14	---	---	---	---
Choctaw	5,522	4,714	54	553	63	---	---	463	---	---	---	---
Creek	7,641	5,199	4,627	9	364	44	---	155	---	---	---	---
Seminole	861	751	28	---	28	4	---	78	---	---	---	---
Oregon.	1,224	1,977	616	83	177	30	12	119	40	32	39	25
Klamath	408	393	294	5	3	12	---	76	3	31	9	16
Salem:												
Siletz	150	137	129	1	---	4	1	1	---	3	---	---
Grande Ronde	100	85	77	---	---	3	---	5	5	10	1	---
Public Domain	20	1	---	---	---	---	---	---	---	19	---	---
Umatilla	238	203	116	---	---	10	9	42	26	5	14	9
Warm Springs	308	258	---	77	174	---	2	---	5	50	15	---
South Dakota.	7,929	6,903	2,642	1,296	1,127	604	117	1,177	28	389	320	381
Cheyenne River	897	845	353	108	197	110	3	74	---	30	28	60
Crow Creek:												
Crow Creek	225	227	198	---	4	24	---	71	---	8	3	13
Lower Brule	210	177	93	---	9	31	44	---	---	8	---	6
Flandreau	92	85	54	2	2	22	4	1	---	7	1	---
Pine Ridge	2,543	2,260	541	743	535	25	25	390	---	48	132	111
Rosebud	1,928	352	602	352	225	93	10	441	2	346	104	120
Yankton	709	468	287	3	20	70	31	50	7	65	33	15

Sisseton	718	664	350	135	199	104	11	17	72	19	35
Standing Rock I.....	607	234	130	54	30	46	7	64	91	29	21
Utah	452	371	152	91	32	3	10	87	87	19	7
Uintah and Ouray.....	337	294	130	53	17	3	1	49	49	3	7
Painte:.....											
Goshute.....	39	33	31	1	2				6	3	
Shivwits.....	26	23	10	1	12				3	1	
Skull Valley.....	11	8	7		1				3	1	
Scattered Bands.....	26	10	10						16	3	
Allen Canyon (under Consolidated Ute).....	13	3		1					10	2	
Washington	3,496	3,080	2	14	78	195	108	207	356	89	48
Colville:.....			117								
Colville.....	850	764	646		16	102	4	53	41	13	8
Spokane.....	270	240	227			9			30	9	
Taholah.....	529	464	427		13	11	10	11	67	19	13
Tulalip.....	903	710	117	11	14	5	46	11	98	34	
Yakima.....	944	709	555	3	35	68	48	132	130	14	27
Wisconsin	2,838	2,416	981	380	153	235	5	761	370	62	86
Keshena.....	572	574	151	348	8	5	3	6	13	5	34
Lac du Flambeau:.....											
Lac du Flambeau.....	218	205	47	18	15	11		17	14	13	18
Red Cliff.....	187	170	41		10	13		6	11		
Crandon.....	165	89	77		12			50	28		2
Bad River.....	396	341	103		20	58		28	38	8	11
Lac Courte Oreilles.....	441	397	240		28	39		9	47	15	12
St. Croix.....	94	76	71		3	2		9	9	1	
Tomah:.....											
Oneida.....	333	313	235	14	25	6	1	461	20	5	
Winnebago.....	432	251	117		32	101	1	175	190	15	9
Wyoming	729	625	156	169	21	273	6	70	78	17	50
Shoshoni:.....											
Shoshoni.....	360	313	117	150	13	30	3	40	40	6	40
Arapaho.....	369	312	39	19	8	243	3	30	38	11	10

1 1934 data

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1935

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Total	24, 192	19, 651		
Arizona:				
Colorado River Agency:				
Mohave Indian.....	15	12	B-4.....	Day.
Fort Apache Agency:				
Fort Apache.....	370	220	B-9.....	Reservation boarding.
Fort Apache day pupils.....	168	83	B-9.....	
Canyon.....	32	20	B-3.....	Day.
Cibicue.....	50	46	B-4.....	Do.
Theodore Roosevelt.....	265	207	B-9.....	Reservation boarding.
Hopi Agency:				
Chimopovy.....	73	64	B-7.....	Day.
Hotevilla-Bacabi.....	132	113	B-9.....	Do.
Oraibi.....	93	88	B-8.....	Do.
Polacca.....	139	116	B-9.....	Do.
Second Mesa.....	79	73	B-8.....	Do.
Navajo Agency:				
Hopi Reservation (part of):				
Keams Canyon (formerly Hopi).....	159	154	B-9.....	Reservation boarding.
Leupp Reservation:				
Leupp.....	336	301	B-10.....	Do.
Leupp day pupils.....	23	18	B-6.....	
Southern Navajo Reservation:				
Chin Lee.....	135	135	B-6.....	Reservation boarding.
Chin Lee day pupils.....	3	3	B-6.....	
Southern Navajo (Fort Defiance).....	298	287	B-6.....	
Southern Navajo day pupils.....	1	1	B-6.....	
Tohatchi.....	190	101	B-7.....	Day.
Cornfields.....	30	26	B-5.....	Do.
Crystal.....	31	24	B-3.....	Do.
Kinlichee.....	31	29	B-3.....	Do.
Klagetoh.....	34	29	B-2.....	Do.
Western Navajo Reservation:				
Tuba City (formerly Western Navajo).....	354	348	B-8.....	Reservation boarding.
Tuba City day pupils.....	44	29	B-8.....	
Moencopi.....	83	76	B-6.....	Day.
Phoenix School:				
Phoenix.....	569	468	7-12.....	Nonreservation boarding.
Pima Agency:				
Pima (Central).....	307	189	B-9.....	Day.
Blackwater.....	63	44	B-5.....	Do.
Casa Blanca.....	126	84	B-5.....	Do.
Gila Crossing.....	66	57	B-6.....	Do.
Maricopa.....	34	24	B-6.....	Do.
Salt River.....	183	158	B-7.....	Do.
Santan.....	110	90	B-5.....	Do.
San Carlos Agency:				
San Carlos.....	138	85	B-9.....	Reservation boarding.
San Carlos day pupils.....	325	261	B-9.....	
Sells Agency:				
Chui Chiuschu.....	17	9	B-3.....	Day.
Kerwo.....	35	24	B-3.....	Do.
Poso Redondo.....	39	20	B-7.....	Do.
Santa Rosa.....	127	70	B-6.....	Do.
Sells-Vamori.....	120	84	B-7.....	Do.
Ventana.....	52	36	B-3.....	Do.
Truxton Canon:				
Truxton Canon.....	217	198	B-8.....	Reservation boarding.
Havasupai.....	36	34	B-5.....	Day.
Peach Springs.....	28	24	B-8.....	Do.
California:				
Sherman Institute.....	865	650	8-12.....	Nonreservation boarding.
Colorado:				
Consolidated Ute Agency:				
Ignacio.....	200	192	B-9.....	Reservation boarding.
Ute Mountain.....	88	84	B-7.....	Do.
Florida:				
Seminole Agency:				
Seminole.....	48	11	B-4.....	Day.
Idaho:				
Fort Hall Agency:				
Fort Hall.....	171	119	B-9.....	Reservation boarding.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1935*—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Iowa:				
Sac and Fox Agency:				
Mesquakie.....	48	37	B-3.....	Day.
Kansas:				
Haskell Institute.....	778	649	10-12.....	Nonreservation boarding.
Minnesota:				
Consolidated Chippewa Agency:				
Pine Point.....	71	48	B-8.....	Day.
Pipestone School.....	279	271	B-9.....	Nonreservation boarding.
Red Lake Agency:				
Cross Lake.....	120	111	B-6.....	Reservation boarding.
Mississippi:				
Choctaw Agency:				
Bogue Chitto.....	42	19	B-5.....	Day.
Bogue Homo.....	19	12	B-6.....	Do.
Conehatta.....	60	35	B-6.....	Do.
Pearl River.....	91	68	B-8.....	Do.
Red Water.....	60	52	B-6.....	Do.
Standing Pine.....	41	21	B-6.....	Do.
Tucker.....	76	52	B-7.....	Do.
Montana:				
Blackfeet Agency:				
Heart Butte.....	10	4	B.....	Do.
Rocky Boy's Agency:				
Forest Camp (or Beaver Creek Camp.).....	39	19	B-4.....	Camp Day.
Haystack Butte.....	45	31	B-9.....	Day.
Parker Canyon.....	32	19	B-5.....	Do.
Rocky Boy's.....	19	15	B-3.....	Do.
Sangrey.....	43	28	B-6.....	Do.
Tongue River Agency:				
Tongue River.....	69	64	B-8.....	Reservation boarding.
Tongue River day pupils.....	27	19	B-7.....	
Birney.....	43	36	B-6.....	Day.
Muddy Creek.....	9	7	B-1-2-4-7-8.....	Do.
Nevada:				
Carson Agency:				
Carson.....	461	413	B-11.....	Nonreservation boarding.
Fort McDermitt.....	36	26	B-6.....	Day.
Lovelock.....	41	24	B-7.....	Do.
Nevada.....	80	67	B-8.....	Do.
Walker River Agency:				
Fallon.....	30	18	B-5.....	Do.
Walker River.....	83	57	1-8.....	Do.
New Mexico:				
Albuquerque School.....	739	679	7-12 and vocational..	Nonreservation boarding.
Jicarilla Agency:				
Jicarilla Apache.....	93	84	B-6.....	Reservation boarding.
Mescalero Agency:				
Mescalero.....	114	97	B-6.....	Do.
Whitetail Apache.....	35	25	B-6.....	Day.
Navajo Agency:				
Charles H. Burke School.....	434	383	7-12.....	Nonreservation boarding.
Eastern Navajo Reservation:				
Eastern Navajo (Pueblo Bonito).....	397	358	B-6.....	Reservation boarding.
Pinedale.....	23	21	B-3.....	Day.
Northern Navajo Reservation:				
Burnhams.....	12	8	B.....	Do.
Biclabito.....	24	20	B.....	Do.
San Juan 1 and 2.....	312	298	B-8.....	Reservation boarding.
San Juan 1 and 2 day pupils.....	76	70	B-8.....	
Toadlena.....	221	217	B-6.....	Do.
Nava.....	53	47	B-6.....	Day.
Redrock.....	34	25	B-4.....	Do.
Saynostee.....	75	52	B-3.....	Do.
Teenospos.....	21	14	B-1.....	Do.
Santa Fe Agency:				
Santa Fe.....	521	506	6-12.....	Nonreservation boarding.
Nambe.....	25	23	B-6.....	Day.
Picuris.....	30	27	B-5.....	Do.
San Ildefonso.....	30	25	B-6.....	Do.
San Juan.....	85	77	B-6.....	Do.
Santa Clara.....	66	62	B-6.....	Do.
Taos.....	187	178	B-9.....	Do.
Tesuque.....	22	15	B-6.....	Do.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1935*—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Southern Pueblos Agency:				
Acomita.....	99	86	B-6.....	Day.
Chicale.....	24	19	B-6.....	Do.
Cochiti.....	50	46	B-6.....	Do.
Encinal.....	15	13	B-4.....	Do.
Isleta.....	120	100	B-6.....	Do.
Jemez Mission.....	31	27	B-3.....	Do.
Jemez.....	50	44	B-6.....	Do.
Laguna.....	53	53	B-6.....	Do.
McCartys.....	65	55	B-6.....	Do.
Mesita.....	25	18	B-6.....	Do.
Paguate.....	78	67	B-6.....	Do.
Paraje.....	32	28	B-6.....	Do.
Sandia.....	20	19	B-6.....	Do.
San Felipe.....	60	50	B-6.....	Do.
Santa Ana.....	25	25	B-7.....	Do.
San Domingo.....	111	95	B-6.....	Do.
Seama.....	22	19	B-6.....	Do.
Sia.....	21	20	B-6.....	Do.
Zuni Agency:				
Nutria.....	24	22	B-6.....	Do.
Zuni.....	194	169	1-10.....	Do.
North Carolina:				
Cherokee Agency:				
Cherokee.....	208	166	11.....	Reservation boarding.
Cherokee day pupils.....	145	119	7-11.....	
Big Cove.....	¹ 41	¹ 32	B-5.....	Day.
Birdtown.....	61	41	B-7.....	Do.
Soco.....	100	71	B-6.....	Do.
North Dakota:				
Bismarck School:				
Bismarck School.....	113	107	5-10.....	Nonreservation boarding.
Fort Berthold Agency:				
Independence.....	29	17	B-8.....	Day.
Nishu.....	24	18	B-7.....	Do.
Shell Creek.....	62	40	B-7.....	Do.
Fort Totten Agency:				
Fort Totten School.....	121	92	B-10.....	Reservation boarding.
Fort Totten day pupils.....	36	27	B-10.....	
Turtle Mountain Agency:				
Turtle Mountain.....	651	386	B-10.....	Day.
Indian Day No. 5.....	87	52	B-6.....	Do.
Roussin.....	84	53	B-3.....	Do.
Wahpeton School.....	327	307	1-10.....	Nonreservation boarding.
Oklahoma:				
Cheyenne and Arapaho Agency:				
Cheyenne and Arapaho.....	239	185	1-9.....	Reservation boarding.
Chillico School:				
Chillico School.....	754	652	6-12.....	Nonreservation boarding.
Kiowa Agency:				
Fort Sill.....	190	148	2-9.....	Reservation boarding.
Riverside.....	234	210	B-9.....	Do.
Pawnee Agency:				
Pawnee.....	² 195	166	B-9.....	Do.
Quapaw Agency:				
Seneca.....	254	247	B-9.....	Do.
Five Civilized Tribes Agency:				
Sequoyah Orphan Training School.....	371	349	1-12.....	Nonreservation boarding.
Creek Nation:				
Euchee.....	143	110	B-9.....	Do.
Eufaula.....	161	150	B-10.....	Do.
Chickasaw Nation:				
Carter Seminary.....	197	177	B-9.....	
Choctaw Nation:				
Jones Male Academy.....	208	179	B-9.....	Do.
Wheelock Academy.....	139	128	B-9.....	Do.
Oregon:				
Salem School:				
Salem School.....	374	293	8-12.....	Nonreservation boarding.
Warm Springs Agency:				
Warm Springs.....	161	146	B-8.....	Reservation boarding.
Burns.....	44	41	B-8.....	Day.
South Dakota:				
Cheyenne River Agency:				
Cheyenne River.....	205	172	3-9.....	Reservation boarding.
Cherry Creek.....	44	25	B-6.....	Day.
Green Grass.....	32	21	B-6.....	Do.
Thunder Butte.....	25	19	B-6.....	Do.

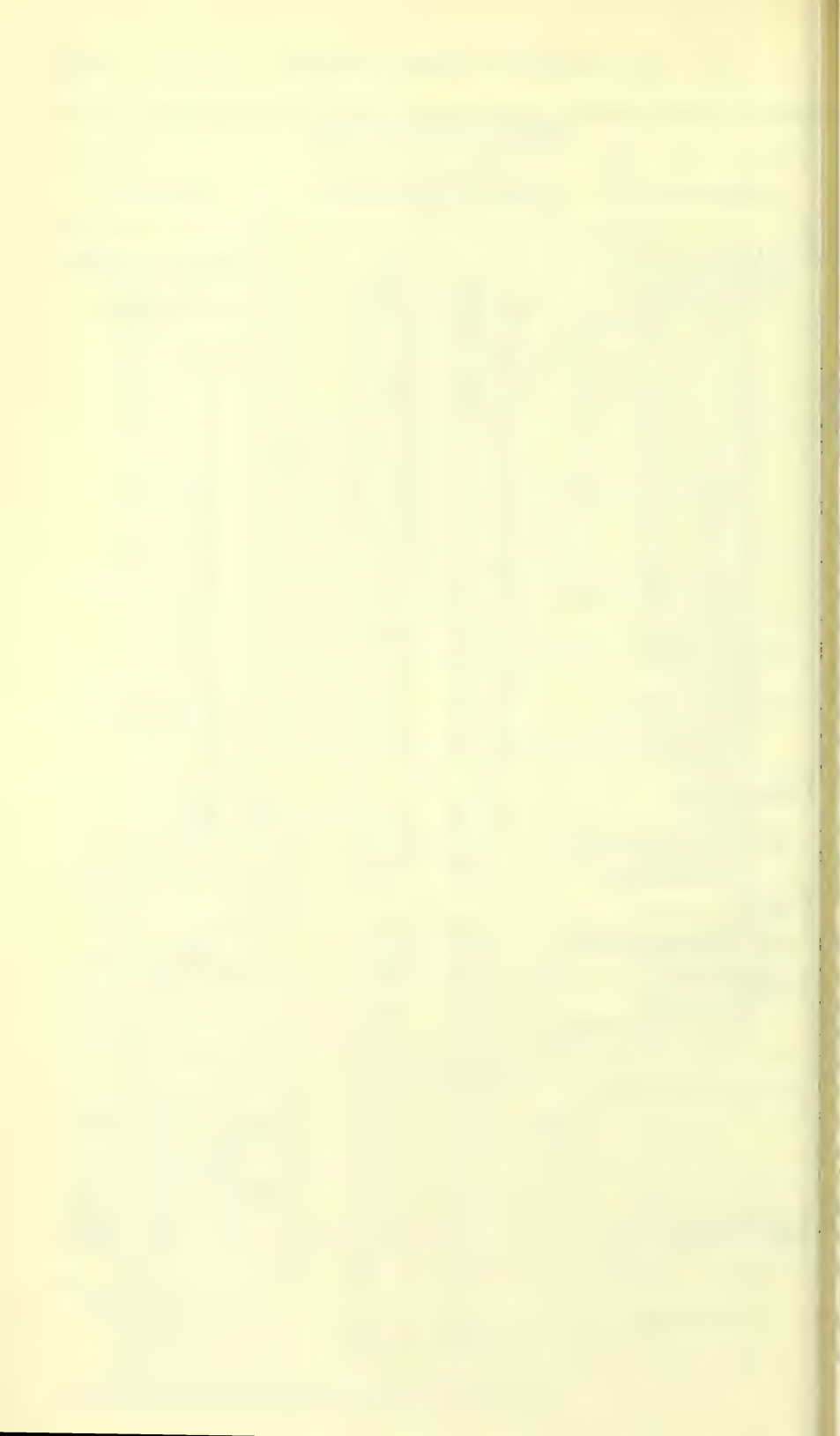
¹ Data from report of 12-31-34.² 81 of these children attend public school, but live at boarding school.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1935—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
South Dakota—Continued.				
Flandreau School.....	477	429	10-12.....	Nonreservation boarding.
Pierre School.....	266	240	1-10.....	Do.
Pine Ridge Agency:				
Pine Ridge (Oglala).....	434	355	B-12.....	Reservation boarding.
Pine Ridge (Oglala) day pupils.....	175	104	B-12.....	
No. 4.....	22	20	B-6.....	Day.
No. 5.....	48	33	B-6.....	Do.
No. 6.....	36	21	B-6.....	Do.
No. 7.....	34	21	B-6.....	Do.
No. 9.....	42	25	B-6.....	Do.
No. 10.....	19	11	B-6.....	Do.
No. 12.....	22	44	B-6.....	Do.
No. 13.....	16	8	B-5.....	Do.
No. 15.....	25	18	B-4.....	Do.
No. 16.....	42	17	B-6.....	Do.
Grass Creek.....	13	9	B-3.....	Do.
No. 22.....	30	17	B-6.....	Do.
No. 23.....	26	21	B-6.....	Do.
No. 24.....	56	30	B-6.....	Do.
No. 25.....	17	23	B-6.....	Do.
No. 26.....	24	11	B-6.....	Do.
Red Shirt Table.....	22	12	B-6.....	Do.
American Horse or Allen Day School.....	127	80	B-8.....	Do.
Kyle.....	174	134	B-9.....	Do.
Wakpamni Lake.....	17	12	B-6.....	Do.
Rosebud Agency:				
Rosebud.....	235	193	B-10.....	Do.
Blackpipe.....	32	20	B-6.....	Do.
He Dog's Camp.....	172	105	B-9.....	Do.
Little Crow.....	28	23	B-6.....	Do.
Milk's Camp.....	31	23	B-5.....	Do.
Ring Thunder.....	39	31	B-6.....	Do.
Soldier Creek.....	20	14	B-6.....	Do.
Spring Creek.....	36	24	B-6.....	Do.
Utah:				
Paiute Agency:				
Goshute.....	42	35	B-6.....	Do.
Kaibab.....	18	15	B-6.....	Do.
Uintah and Ouray Agency:				
Uintah.....	70	46	B-8.....	Reservation boarding.
Uintah day pupils.....	104	62	B-8.....	
Wisconsin:				
Keshena Agency:				
Neopit.....	38	26	B-8.....	Day.
Lac du Flambeau Agency:				
Lac du Flambeau.....	155	119	B-9.....	Do.
Tomah School.....	156	64	1-10.....	Nonreservation boarding.
Wyoming:				
Shoshone Agency:				
Shoshone.....	163	114	B-9.....	Do.
St. Lawrence E. C. C. Day.....	10	9	.....	Do.

SCHOOL SUMMARY

Class	Number of schools	Enrollment	Average attendance
Total.....	197	24, 192	19, 651
Nonreservation boarding.....	21	8, 322	7, 195
Reservation boarding.....	30	6, 368	5, 492
Day.....	146	9, 502	6, 964



THE NATIONAL PARK SERVICE

(ARNO B. CAMMERER, Director)

An expanded National Park Service during the 1935 fiscal year established an outstanding record of achievement. The great Public Works and Emergency Conservation programs, initiated or approved during the preceding year, were in full swing on July 1, 1934, and during the ensuing year were carried on at high speed.

Supervision of work under the emergency programs resulted in a heavy strain on all park supervisory personnel, both in the Washington Office and the field, and entailed an unusual amount of overtime work on a staff long inured to overtime. To insure protection of the natural features of the parks and prevent any operations not in conformity with park policies and ideals, the supervisory forces were greatly augmented under the emergency programs. Technicians skilled in engineering, landscaping, architecture, forestry, wildlife problems, geology, and other natural sciences carefully watched details of field work to enforce compliance with approved plans on all projects.

The sympathetic support of the Secretary of the Interior and other officials of the Department of the Interior and the cooperation of specialists in various other Federal bureaus were invaluable during this period of high-peak activity.

In keeping with its record of achievement the Service reports the most interesting travel figures in the history of the national parks and monuments. Public use of these areas for the travel year which ended September 30, 1934, was the greatest ever experienced. The total number of visitors to the national parks, monuments, military parks, and other areas of the system amounted to 6,337,206. Travel to those national parks for which statistics were published last year showed an increase of 22 percent over the preceding year. No comparative statistics for the total travel are available, since the transfer of numerous areas from the jurisdiction of the War Department and Department of Agriculture was made toward the end of the previous travel year, and complete travel figures for them could not be obtained.

During the summer of 1934 President Roosevelt, with his sons, Franklin, Jr., and John, visited the Hawaii National Park. On August 5, with Mrs. Roosevelt, the President visited Glacier National

Park where over a Nation-wide hook-up he emphasized the recreational and spiritual advantages to be gained from visits to the national parks. Of interest was his suggestion at that time that the slogan "1934—A National Park Year" be changed to "Every Year a National Park Year." Mrs. Roosevelt also visited several other national parks and in a radio talk last spring spoke enthusiastically of her experiences in these areas.

In line with the President's suggestion that every year be a national park year, the preseason travel of 1935 showed a gain over that for the same months of the previous year. Present indications are that last year's record will be well surpassed when the travel season closes on September 30. On June 30 an increase of 2 percent in visitors to the wilderness parks was recorded, with the weekly gain constantly mounting.

Through an allotment from emergency funds the National Park Service was enabled to participate in the California Pacific International Exposition at San Diego. In the exhibits special emphasis was laid upon the activities of the Civilian Conservation Corps in the national parks and monuments. The operation of a model laboratory by enrollees in a booth of the Natural History Museum Building is attracting much attention, as is the model Civilian Conservation Corps camp adjacent to the Federal Building. In the camp a detachment of 50 enrollees demonstrates typical conservation activities on park lands, such as tree planting and trail building. Dioramas, motion pictures, and colored enlargements depict scenes in the national parks.

Field officers of the National Park Service met in conference in Washington last November with officials of the headquarters office and specialists of cooperating bureaus to discuss questions of park policy and administration. This conference was productive of far-reaching results, occurring, as it did, at a time when the Service was expanding its activities in all lines. It was particularly effective in orienting a number of administrative officers newly appointed in the field and Washington.

EMERGENCY CONSERVATION WORK

Continuation of the President's Emergency Conservation Work program permitted the National Park Service to benefit to a still greater degree in the conservation activities for the protection of the national parks and monuments, and provided material expansion in the program for State, county, and metropolitan parks.

The interest which has been stimulated in conservation work in the United States through the Emergency Conservation Work program has, to a large degree, been responsible for a new interest

and appreciation of recreational facilities and has made the citizens of the Nation conscious of the desirability of extending national park and monument boundaries and of the establishment and enlargement of State, county, and metropolitan park areas. As a result, further acquisition of land for State parks came through donations by private individuals or corporations, and, in a number of States, through continued or resumed park-land purchases. In some instances county or city funds were expended in the purchase of desirable park lands.

While no States newly entered the park field during the past 12 months, the addition of new parks and enlargement of older holdings proceeded steadily. The National Park Service records an increase in State parks of 67,300 acres of land during the 7 months from September 1, 1934, to April 1, 1935, and additional acreage has been acquired since then. These additions have been in the States of Alabama, Arkansas, California, Connecticut, Florida, Georgia, Illinois, Iowa, Kentucky, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, New Hampshire, New York, North Dakota, Ohio, Rhode Island, South Carolina, Tennessee, Texas, Virginia, Washington, and West Virginia.

In order to assist in formulating park policies and programs dealing with the States, the following advisory committee on State parks was appointed to serve without compensation:

Col. Richard Lieber, president of the national conference on State parks, and past director of the Conservation Commission of Indiana, as chairman; Horace M. Albright, past director of the National Park Service; Harland Bartholomew, city planner of St. Louis; Tom Wallace, newspaper editor and park enthusiast, Louisville; and Miss Harlean James, secretary of the American Planning and Civic Association. William E. Carson, past chairman of the Virginia Conservation and Development Commission, also was appointed as collaborator to assist in State park work.

The Director continued to serve as the Interior Department representative on the Advisory Council to Hon. Robert Fechner, Director of Emergency Conservation Work, with the Associate Director as alternate. Chief Forester J. D. Coffman acted as liaison officer for the various bureaus of the Department of the Interior and supervised the program for the national parks and monuments. Assistant Director Conrad L. Wirth, Chief of the Branch of Planning, directed the Emergency Conservation Work in the State parks and related areas.

All Civilian Conservation Corps work within areas under the jurisdiction of the National Park Service continued to be carefully planned by experienced landscape architects, engineers, foresters, wildlife

experts, geologists, and archeologists so as to preserve the distinct natural features. In addition, in the historical and military parks historical technicians were utilized to insure the careful preservation and interpretation of the historical values.

During the third enrollment period, April 1 to September 30, 1934, which came partly within the fiscal year 1935, 102 camps were operated in national parks and monuments and 208 in State parks and related areas, the camps being located in 40 different States. During the fourth enrollment period, October 1, 1934, to March 31, 1935, 79 camps were operated in national parks and monuments and 293 in State parks and associated areas, the camps being in 41 States. When the drought relief Emergency Conservation Work program was established, six drought relief Emergency Conservation Work camps were assigned to national parks and monuments and 52 such camps to the State parks and other areas subject to the administration of the State Park Division.

The legislation extending the Emergency Conservation Work for another 2-year period enabled the President to authorize an increase in the scope of the program; and a total of 600 camps was allotted to the National Park Service for the fifth enrollment period, April 1 to September 30, 1935, with 118 camps in national parks and monuments and 482 in State-park areas. Plans are under way to continue the camps for the sixth enrollment period, October 1, 1935, to March 31, 1936. When, in January 1934, the Emergency Conservation Work program was extended to the Hawaiian Islands, with 577 enrollees on four islands working from camps and from their homes, general supervision was assigned to the National Park Service. Subsequently, the program for the participation of the Territory of Hawaii has been increased so that 1,212 enrollees now are allotted to that work. In the second enrollment period one 200-man camp was established at Hawaii National Park, and it has continued in operation to date. Also in December 1934, two camps, one composed of 60 enrollees on the Island of St. Thomas and another of 100 enrollees on the Island of St. Croix, were assigned to the Virgin Islands.

Approximately 150,000 young men in all have been engaged in the work subject to the National Park Service, with the employment of about 6,000 professionally and technically trained individuals to direct the work.

A statement of material accomplishments under the Emergency Conservation Work program in National, State, and allied areas under National Park Service supervision is given in table 9.

RECREATIONAL LAND-USE REPORT TO NATIONAL RESOURCES BOARD

The Recreation Division of the National Resources Board, set up within the National Park Service for the purpose of preparing that section of the Board's report entitled "Recreational Use of Land in the United States", submitted a preliminary report on October 1 and the final report on November 1.

With the limited time allotted to its preparation, a detailed study of the underlying basic facts concerning recreational needs and existing facilities throughout the Nation could not be undertaken. It was possible, however, to accumulate much valuable information on the subject in the brief time available.

The report strongly showed the need for a broad and exhaustive Nation-wide survey on this subject and contained an urgent recommendation therefor. As a result, plans for such a survey have been approved by the Secretary of the Interior and hopes are entertained that an allotment for the purpose may be made available from emergency funds.

The recreation division of the report was prepared by a committee consisting of George M. Wright, Chief of the Wildlife Division, chairman; Assistant Director Conrad L. Wirth; and Chief Forester John D. Coffman. Herbert Evison, Supervisor of State Park Emergency Conservation Work, served as principal assistant to the chairman, and the services of L. H. Weir, recreational specialist of the National Recreational Association, were obtained on a full-time basis during the preparation of the report.

In view of projected plans for a further study of the broad field of recreation, continuation of the committee was deemed desirable. Mr. Wright continues as chairman, Mr. Wirth is vice chairman, and Mr. Evison executive secretary.

LEGISLATION PENDING TO PROVIDE FEDERAL COOPERATION IN STATE PARK DEVELOPMENT

Bills to provide Federal cooperation in the development of State parks were reintroduced in the Seventy-fourth Congress and received favorable committee reports in both the Senate and House of Representatives.

The proposed legislation would give the Secretary of the Interior power to authorize the National Park Service, cooperating with other Federal and State agencies, to make a comprehensive study of the public parks, parkways, and recreational-area programs of the United States, and to aid the States in planning, establishing, improving, and

maintaining those areas. This is in accordance with the recommendations of the Recreation Division of the National Resources Board.

An important proviso of the pending bills is the authority granted the President, upon recommendation of the Secretary of the Interior and concurrence of the Department having jurisdiction, to transfer such Federal lands to the State as are not required for Federal purposes and are chiefly valuable for recreation.

The National Conference on State Parks, made up of State park authorities, has uniformly endorsed this proposed legislation, as has the American Planning and Civic Association, the Association of State Foresters, and other organizations interested in conservation. The benefit that would accrue from it has been amply demonstrated during the past 2 years by the results of the temporary cooperation brought about by supervision of State Park Emergency Conservation Work activities of the National Park Service.

SPORT AND OTHER WINTER USE OF PARK AREAS GROWING

Once considered as purely seasonal in their public appeal, the national parks and monuments are becoming of increasing interest for winter use each year. This growing use during the late fall, winter, and early spring months is bringing up problems in connection with all-year personnel, accommodations for visitors, and particularly winter-sport development to which a great deal of study is being given.

The most striking winter-use development is that in connection with winter sports. This development has not come about through the efforts of the National Park Service to stress or publicize this type of use. Rather the public demand for cold-weather recreational areas has impelled the Service to take cognizance of the possibilities for cold-weather sport use of many areas under its supervision, and to make them available for such use where practicable with limited funds and personnel.

The action of the National Ski Association, at its annual meeting in Chicago last December, in selecting Mount Rainier National Park as the scene of its national championship downhill and slalom ski races focused attention definitely upon the outstanding opportunities for winter-sport developments available in those mountainous national parks enjoying comparatively mild climates and easy accessibility. The championship meet, which took place at Paradise Valley, was one of outstanding interest and attracted 7,000 visitors. Parking space for 2,000 cars was provided. Mount Rainier was also the scene of tryouts of contestants in certain ski events to represent the United States in the next Olympic games.

Yosemite National Park continued to be one of the important centers in winter sports. The second annual invitation ski meet was held February 2 and 3 on the ski slopes about 15 miles above the floor of the valley. Skiing has become the principal winter attraction in Yosemite, and the all-year maintenance of the Wawona Road and a portion of the Glacier Point Road resulted in the use of contiguous areas by thousands. From December 22 to March 31, 11,914 people used the ski fields, the total in 1 day being as high as 500.

The Giant Forest-Lodgepole winter area in Sequoia National Park attracts thousands of visitors from the valley cities of California, about 2 hours' drive from the park over excellent paved roads. The annual Sierra-San Joaquin Winter Carnival, heretofore held in Yosemite, took place at Lodgepole on January 12 and 13, with an attendance of over 4,000 people on the latter day.

Informal use of toboggan slides and skating rinks in the General Grant National Park has shown a considerable increase and the demand for these facilities continues to grow. The tenth annual ceremony at the base of the General Grant Tree, dedicated as the Nation's Christmas Tree, was held at high noon on Christmas Day.

Although weather conditions in Rocky Mountain National Park were exceptionally mild, public interest in winter-sports activities in this area, which was one of the pioneers in the national park field, showed a marked increase. Tournaments sponsored by the Estes Park Snow Club and the Ski Club of Grand Lake were well attended, and the fifth midsummer ski carnival held in Estes Park on June 22 and 23 by the local club was an outstanding success.

The Crater Lake Ski Club held a carnival at Fort Klamath in March. One of the features of this annual meet was a 16-mile downhill race from Crater Lake Lodge to the ski grounds, and another 32-mile race comprising a round trip between these two points.

The third annual ski tournament, sponsored and conducted by the Mount Lassen Ski Club, was held in Lassen Volcanic National Park. In this the National Park Service has taken no active part, but with the constantly increasing demand for winter sports in the park, officials are striving to make available facilities for such activities on a safe and satisfactory basis. So far inadequacy of funds and equipment has prevented much progress.

Hot Springs, Hawaii, and Grand Canyon National Parks also are popular during the winter, Hot Springs in particular being famous for many years as a winter resort. Hawaii Park, from the climatic standpoint, is equally favorable to travel throughout the year. Carlsbad Caverns has a goodly share of visitors in the winter. Al-

though encountering changing weather conditions on the surface, visitors find in the caverns a practically stable temperature of 56° Fahrenheit throughout the year. No official count was made of winter travel to the Great Smoky Mountains National Park, but park officers reported that the number of visitors to that area continued to mount. Wind Cave and Platt also showed decided gains. Other national parks to remain open all year were Acadia, Zion, Fort McHenry, and Lincoln's Birthplace. Of the 24 national parks, but 6 now are closed to winter travel.

The ideal season for visits to Death Valley and many of the other southwestern national monuments is during the winter months. Travel to Death Valley National Monument for the winter season showed a phenomenal increase, a number of the visitors utilizing the airplane facilities at Furnace Creek.

The historic areas of the East and South entertain visitors throughout the year, and this use is expected to grow as developments now under way are completed.

INFORMATION SERVICE TO THE PUBLIC

All possible effort was made to furnish to the public full information on the national parks. In the field of printed material, however, adequate service was impossible because of the limited funds available. So small were the editions of information circulars which could be issued for the scenic parks that the supplies retained for distribution from the Washington office were in most cases exhausted by the end of June, shortly after the regular park travel season opened. It is predicted that the supplies of practically all of these booklets will be completely exhausted, both in Washington and in the field, by the first of September.

If the National Park Service is to continue to function fully for the benefit of the traveling public, it is imperative that adequate printing funds be made available. Plans now are being made to go to press within the next 4 months on all the park information circulars for 1936, in order that printed information may be available as early in the coming calendar year as possible for the use of those planning park trips, for clubs and other organizations undertaking national park study courses, for students making parks the theme of their dissertations, and for the great body of school children, the future travelers of the Nation, who now are intensively studying the subject of parks.

Available printing funds now permit the publication of exceedingly limited editions of information circulars on the older scenic parks only. No provision is made in the printing allotment for guides to the points of interest in the military and other historic

and prehistoric parks and monuments which, since President Roosevelt's reorganization of August 1933, make up more than half the number of parks and monuments under the administration of the National Park Service. If these areas are to be of maximum usefulness and enjoyment to visitors, they must be interpreted in the light of the events which made them of national interest. To do this printed material is essential, since it is obvious that the two million people visiting these areas cannot all obtain information through first-hand contact with the limited ranger-historian staff. During the past 2 years the Service has endeavored to meet this situation through the issuance of small leaflets prepared by the multilith process through the courtesy of the miscellaneous service division of the Department of the Interior. Because of limitations of equipment and personnel in that division, the leaflets necessarily are held to a small size and to extremely small editions inadequate to meet the demand.

One of the greatest needs of the interpretation program in the Service today is to have made available the results of studies conducted by the various scientific and technical staffs of the Service for distribution in printed form. Otherwise in many cases the benefits of the projects undertaken are largely nullified. This condition prevails particularly in the field of wildlife, where studies are made for the purpose of obtaining data to serve as the basis for the formulation of broad programs looking toward the preservation in unmodified condition of the native fauna in our national parks. Only one such report could be issued during the year.

Through the cooperation of the director of emergency conservation work, a revised edition of 50,000 copies of the publication entitled "Glimpses of our National Parks" was issued. The revised booklet, outlining the general objectives of the National Park Service and the activities of the Civilian Conservation Corps in the national parks, in addition to descriptive material on these areas, made an interesting addition to the libraries of the Civilian Conservation Corps camps.

POSTERS

The first colored posters depicting national-park activities to be printed by the Department of the Interior were issued shortly after the close of the 1934 fiscal year. These were followed by 2 others stressing winter sport activities, and later by another series of 3 representing historic, prehistoric, and wildlife phases of national-park work. Only small editions of these various posters, financed from emergency funds, were possible. The demand for them, and their display in places prominent throughout the country.

proved the desirability of the extension of this type of printing. Educational institutions showed a marked interest in the posters, using them in connection with art and geography classes, and for general display.

RADIO BROADCASTS

Probably the widest publicity given to the national parks and monuments during the past year resulted from the expanded radio programs. Through the courtesy of the National Broadcasting Company, a series of 14 Nation-wide broadcasts was given in the late spring and early summer, with half-hour programs. The Secretary of the Interior opened the series; Mrs. Roosevelt gave an interesting talk on practical phases of park trips, such as the safety of horse-back riding and desirable costuming; and officials of cooperating Federal bureaus joined National Park Service officials in the discussion of many phases of park work. The Marine Band cooperated by playing on 6 of the programs, the Navy Band on 1, and the Army Band on 1. Vocal selections on several of the programs were given by Civilian Conservation Corps enrollees.

Under the auspices of the State chamber of commerce and the Federal Business Association of California, several radio talks were given by officials of the National Park Service in the West during the months of April, May, and June.

In addition to the Nation-wide and other special broadcasts, a series of 20 mimeographed talks on specialized park subjects was prepared in the Washington office of the National Park Service and sent to more than 200 radio stations requesting such material.

VISUAL EDUCATION SERVICE

Under the emergency program it was possible to push the motion picture production program, with the principal objective of recording the accomplishments of the Civilian Conservation Corps in the areas under the jurisdiction of the National Park Service. During the year 6 silent and 9 sound reels were produced depicting Civilian Conservation Corps activities in national and State parks. One, a two-reel sound picture, is attracting much attention at the California Pacific International Exposition.

In connection with the extensive educational program of the Civilian Conservation Corps camps, a cooperative agreement between the University of Chicago, Electrical Research Products, and the National Park Service resulted in the production and circulation among the camps of six reels of sound pictures in the field of elementary physical geology.

Besides this emergency phase of the visual educational service the National Park Service continued to produce photographs, glass

slides, film slides, and other related visual aids in connection with national parks and monuments for the use of the general public. Such material is furnished on loan for reproduction or showing. Of outstanding interest was the furnishing of pictorial material to the rotogravure sections of various newspapers and news services, and its wide-spread reproduction throughout the press of the country.

An enlarging laboratory was established as part of the Public Works project to provide colored photographic enlargements of national-park scenes for Government buildings. More than 2,000 enlargements were produced and distributed.

RESEARCH AND EDUCATIONAL ACTIVITIES

Work in the fields of research and education has shown advances along all lines. Public interest in guided field trips and the museum and lecture services, coupled with the availability of emergency relief funds, has resulted in considerable expansion. It is interesting to note that the demand exceeded the increase in personnel, so that the educational staffs in the national parks and monuments were hard pushed to handle the crowds desiring to study nature and history at first hand.

A notable contribution of the emergency conservation work to the national park educational service was the employment of several geologists to assist in planning work projects for the 600 Civilian Conservation Corps camps in national and State parks, with a view to so locating trails and other construction activities as to protect all important geological exhibits from possible scar or destruction. Most of the national parks contain noteworthy geologic features or phenomena, not only of inspirational value but also illustrating such great geologic concepts as geologic time, crustal movement, earth sculpturing, stratigraphic sequence, and evolution—in short, the history of the earth.

Under the Emergency Conservation Work program it also was possible to employ wildlife technicians to protect the park animals and their habitats from depredations that might have otherwise resulted from emergency activities.

Field trips, short and long, under the guidance of ranger-naturalists, continued to be one of the most popular of the educational services rendered to the public. Experiments in specialized trips devoted to the study of flowers, trees, animals, and birds have proved that they are desirable in the larger parks where interested groups may be formed for such study.

The lecture service was made more attractive in several of the national parks through the construction of numerous amphitheaters

with Civilian Conservation Corps labor, and the providing of log circles in the public camp grounds. This made possible the transfer of lectures from hotel and lodge lobbies to informal locations more in keeping with the spirit of the outdoors and entirely under Government auspices.

DEVELOPMENTS IN THE HISTORICAL FIELD

The historical and archeological program of the National Park Service continued to broaden and to demonstrate its scientific value. This fact, coupled with the desirability of extending and expanding the system to include the majority of the historic sites of national importance and of integrating the various prehistoric, colonial, socially historic, and military areas into one unified system telling the story of our country from its earliest beginnings, led to the establishment on July 1, 1935, of a branch of historic sites and buildings.

Further expansion in the historic field is proposed in a bill introduced in Congress at the request of the Secretary of the Interior. This pending legislation embodies the proposal to empower the Secretary of the Interior, through the National Park Service, to conduct a Nation-wide survey of historic buildings and sites, and to make it possible for the Federal Government to acquire those which are determined to be of sufficient importance to warrant national recognition. The program provides for cooperation with State and local governments and private individuals in preserving and restoring historic sites and buildings and the means for effectuating major policies.

Formulation of this broad program by the Secretary of the Interior followed a study made at his instructions by J. Thomas Schneider of the preservation of historic buildings and sites in this and neighboring countries and in Europe for the purpose of obtaining data concerning the policies, administration, and activities in this field of various organizations and of foreign Governments. Later Mr. Schneider assisted in drafting the legislation referred to above.

Another bill to establish a National Park Trust Fund Board to invest gifts of funds and property has passed both the House and Senate and awaits the President's signature. Through this legislation acceptable bequests made by State and local governments and private individuals will be held in a trust fund for use in acquiring historic sites and other areas or objects relating to the activities of the Service.

Throughout the past year operation of the military areas transferred to the Service by the President's reorganization of August

1933 was made possible primarily through the application of emergency funds to work therein, and the availability of Civilian Conservation Corps personnel. Not only could protection, improvement, and maintenance be carried on through this emergency organization, but also informative and guide service to the visiting public. This latter activity was the subject of much favorable comment. In a lesser degree emergency funds advanced the work and personal service in other historic areas.

In the Southwest the beginning of an exhaustive study of old Spanish missions has been made, and the San Diego Exposition has brought into highlight the Cabrillo area, where the first Spanish contacts with the West took place. The historical work of the Service has received increasing attention and cooperation from learned and academic organizations, an example of which was the Nation-wide inventory of local historical materials undertaken during the winter under the Federal Emergency Relief Administration. The Historical Division acted as national coordinator for this work which was sponsored by the American Council of Learned Societies and the Social Science Research Council.

MUSEUM EXPANSION

The development of museums in national parks plays a fundamental part in the educational program, and its progress under emergency measures has advanced it to a place of prominence. West of the Mississippi, 21 national parks and monuments include museums as a part of their educational equipment, and 9 of the eastern parks and monuments now have museums.

Exhibits for the eastern museums are in the course of preparation, the work being directed from the headquarters of the Eastern Museum Division in Washington, established in February. With funds made available from public works allotments, museum curators were assigned to eight eastern parks and monuments, and studies made upon which to base the new museum program. At Morristown National Historical Park a field laboratory was established in which a beginning has been made in preparing the variety of exhibits required by the museums in the eastern park areas. The program of the Eastern Museum Division also included plans for a museum in the New Interior Department Building. Its purpose will be to depict the story of the work of the bureaus, show the significance of the organization, and explain the objectives of the Department.

After careful study the museums of many of the western parks and monuments were improved and enlarged. Several new museum buildings have been constructed, equipment purchased, and installations made.

At field educational headquarters in Berkeley and at the Fort Hunt Model Laboratory notable progress was made in the preparation of relief models and miniature exhibits.

LIBRARY DEVELOPMENTS

Practical work in the preparation of bibliographies for parks and monuments was pursued at field educational headquarters with research workers and trained librarians, employed under the Civil Works Administration and the State Emergency Relief Administration. Some 30,000 entries constitute the present systematized card files of the general parks bibliography maintained at the Berkeley office. Papers on the geology, biology, ethnology, archeology, and history of certain western park areas were prepared by research workers to facilitate planning of museum exhibits, and were mimeographed and distributed to park personnel, libraries, and other institutions desiring them. The University of California has continued its cooperation in this library work by making available the facilities of the School of Librarianship, as well as extending unusual privileges in permitting the park staff to use laboratory space and desk equipment.

EDUCATIONAL ADVISORY BOARD

The Educational Advisory Board, appointed by the Secretary of the Interior in an informal capacity as educational advisers to the National Park Service, continued to give valuable assistance in the fields of natural science and history. Two meetings of the Board were held during the year, one on November 9 and 10, 1934, and the other on March 18 and 19, 1935.

At the November meeting the discussions dealt principally with pressing wildlife problems. Special consideration was given to the deplorable condition of the winter elk range in the northern portion of Yellowstone National Park, and it was recommended that an elk reduction program be conducted as an emergency measure. The Board emphasized the fact, however, that the only permanent protective measure for the northern Yellowstone elk herds would be adequate winter range lands.

The Service laid before the Board the proposal that had been made to it for the creation of a lake in the Cades Cove section of the Great Smoky Mountains National Park, that proposal being based upon the premise that at some time in the modern geologic age there might have been a lake in the cove. Upon the findings of the Board that there was no evidence of such a lake ever having been in existence, and its recommendation that none be created, the proposal to introduce an artificial body of water into Cades Cove was acted upon adversely by the Service as being inconsistent with the fundamental principles involved in national-park standards.

The Advisory Board passed a resolution deploring the lack of funds for printing information circulars and expressing the conviction that a full educational and informational program is impossible of achievement without adequate provision for printed material.

At the March meeting the main subject of discussion was new projects in which the National Park Service is vitally interested. Recognizing the importance to conservation of park boundaries sufficiently extensive to include important breeding grounds and winter feeding grounds for wildlife, the Board endorsed the action of the committee on boundary lines in recommending the maximum areas planned for the Everglades National Park. The Board approved in principle the Mount Olympus, Big Bend, and Kings Canyon National Park projects.

Among other problems discussed was that of saving cultural values in national parks, particularly the Great Smoky Mountains, by recording and preserving folk arts.

YOSEMITE SCHOOL OF FIELD NATURAL HISTORY

The tenth annual session of the Yosemite School of Field Natural History, conducted during 1934, was eminently successful. The eleventh session, now in progress, convened the last week in June. The course, which includes a 2 weeks' pack trip into the High Sierra, will last 7 weeks. Special emphasis is given to fieldwork in geology, botany, forestry, mammalogy, ornithology, entomology, and nature guiding. The school is supplemental to college work in these fields, and students must have had 3 years of college work or its equivalent.

It is increasingly apparent that the Yosemite field school, with its training in methods of interpreting living nature, is a needed institution looking toward the improvement of the naturalist service. Five of its graduates were employed during the 1934 summer season as ranger-naturalists in the parks and several others assisted in the wildlife program instituted under emergency funds, making a total of 30 graduates employed by the National Park Service as temporary or permanent naturalists or rangers prior to the current year.

As the 1935 fiscal year drew to a close, plans were being made for the employment of a greater number of graduates during the 1935 season than were used a year ago.

POSSIBILITIES FOR SCIENTIFIC RESEARCH ATTRACT STUDENT AND SCIENTIST ALIKE

The unexcelled opportunities afforded in the national parks and monuments as outdoor laboratories for the study of the natural sciences has led to the use of these areas by numerous educational institutions and individual scientists.

Oglethorpe University sent 44 teachers on a tour of the country, including several of the parks. The University of Colorado held a geology field class in Rocky Mountain National Park. The Winold Reiss Art School, under the auspices of the College of Fine Arts of New York University, held a 3 months' session in Glacier National Park. A historical project in visual education was undertaken in Glacier Park by the College of Education of Drake University for which college credit was given. The field course trip of the School of Education, Western Reserve University, Cleveland, Ohio, included in its itinerary Mount Rainier National Park. The University of Hawaii held its fifth summer sessions in Hawaii National Park.

Work in the field of pure research was interesting. Glacial measurements again were made in Yosemite National Park in cooperation with the International Geophysical Union. Seismological experiments also were undertaken in Yosemite by Dr. John Buwalda, of the California Institute of Technology, to determine the depth of glacial debris and the shape of the valley trough. In the Grand Canyon National Park studies were made by Dr. N. E. A. Hinds, of the University of California, of the Algonkian rocks of the eastern portion of the canyon; by Messrs. John H. Maxson and I. N. Campbell, of the California Institute of Technology, of the Archean rocks of the inner gorge; and by the naturalists of the National Park Service of the Permian rocks of the upper walls of the canyon.

Research work was continued by graduate students under the direction of representatives of the faculties of Columbia, Princeton, and Chicago Universities on the geology and physiography of the Yellowstone-Big Horn region. Dr. H. E. Gregory continued geological studies in Zion National Park for the United States Geological Survey. The naturalist staff in Hawaii National Park compiled data on the Silversword plant preparatory to carrying on experiments to determine the best methods for preserving this rare plant in the Haleakala section of the park. The Museum of Northern Arizona again sponsored archeological research in Wupatki National Monument. The Board of Scientific Governors of the Chicago Academy of Sciences passed a resolution approving the establishment of a research station in the Great Smoky Mountains National Park.

Various governmental, semipublic, and private agencies have continued to aid materially in the solution of scientific and technical problems. Dr. E. P. Meinecke, of the Bureau of Plant Industry; Dr. O. G. Murie, of the Bureau of Biological Survey; Dr. T. S. Palmer, formerly of that Bureau; H. B. Hommon, of the Public Health Service; Dr. A. S. Hazard, of the Bureau of Fisheries; Dr.

Alexander Wetmore, of the Smithsonian Institution; and Dr. Waldo G. Leland, of the Council of Learned Societies, have each personally and through the organizations they represent assisted the work of the national-park program. Dr. Charles Moore, of the Fine Arts Commission, has given generously of his time to the careful investigation of many problems relating to the work, as has Mr. H. P. Caemmerer, the secretary of the Commission. The work of Jesse L. Nusbaum, of the Laboratory of Anthropology at Santa Fe; Dr. A. V. Kidder and Earl Morris, of the Carnegie Institution; Dr. Harold S. Colton, of the Museum of Northern Arizona; H. S. Gladwin, of Gila Pueblo; and Neil Judd and F. H. Roberts, of the Smithsonian Institution, have been outstanding on numerous archeological matters referred to them.

Dr. John C. Merriam, president of the Carnegie Institution of Washington, has been particularly helpful in his continued studies of the scientific features of various parks and methods of presenting the findings of scientists to the general public. Numerous other distinguished scientists visited the national parks pursuing independent investigations.

SCIENTIFIC PAPERS

Outstanding among scientific papers, prepared as a result of research in the national parks, were The Glacial History of an Extinct Volcano, Crater Lake National Park, by Wallace W. Atwood, Jr., formerly Chief of the Naturalist Division of the National Park Service, published in the Journal of Geology, February-March 1935; and a paper on the mule deer of California, by Joseph S. Dixon, of the Wildlife Division of the Service, published by the California Fish and Game Commission. Others were Geophysics—Earthquakes associated with the 1933 eruption of Mauna Loa, Hawaii, by Austin E. Jones, Geological Survey (communicated by T. A. Jaggar), published by the United States Geological Survey, and Hawaiian Travel Times, by Austin E. Jones, published by the Seismological Society of America, January 1935. Glaciers of the Grand Teton National Park of Wyoming, by Fritiof Fryxell, was published in the Journal of Geology. The Missouri Botanical Garden in April published in its bulletin Field and Herbarium Studies, III, by Ranger-Naturalist Louis Williams. This is one of a series of short papers dealing with the plants of the Rocky Mountains, and names several plants in Grand Teton National Park not previously found there. Butterflies of Yosemite National Park, by Ranger-Naturalist John S. Garth, was published in the Bulletin of the Southern California Academy of Sciences, January-April 1935. The Botanical Gazette, December 1934, published *Schilderia Adamanica*: A New Fossil Wood from the Petrified Forests of Arizona, by L. H. Daugherty.

SCIENTIFIC DISCOVERIES

Probably the discovery most important to science made in a national-park area during the past year was the finding on June 7 of the desiccated body of a prehistoric Indian miner who had been trapped by a falling rock in the proposed Mammoth Cave National Park. This specimen is undoubtedly of great importance from a scientific point of view, and every possible effort is being made to obtain the maximum amount of data possible. The individual apparently met his death by accident while engaged in mining operations. The stone under which he was working became loosened and tilted over, trapping him beneath it, pinning him down but not crushing him. Although the air in the cave is moist, the body is in an excellent state of preservation, and experts believe that the air may hold chemicals in suspension which would account for the condition and preservation of the body. Engineers of the National Park Service are studying the best means of moving the rock so as not to destroy the mummy, and a geologist and archeologist are on the ground making a complete investigation.

Although it had been considered by noted scientists that no fossil finds would be made in Death Valley, a park employee discovered near the boundary of the monument practically the entire skull of a titanothere, a prehistoric animal resembling the rhinoceros, but with different horns. A little later, working with a party from the California Institute of Technology, another skull of the same type of mammal was discovered. This was the second discovery of fossil bones from this family west of the Rocky Mountains, and the first discovery of a skull.

Dinosaur tracks were discovered by Civilian Conservation Corps workers in Zion National Park and a 50-foot dinosaur skeleton was found about 1 mile north of the Colorado National Monument boundary.

PROTECTING OUR WILDLIFE

The program to integrate wildlife administration under competent technical supervision, which began with a wildlife survey in 1929, made two significant advances. Wildlife Division headquarters were established in Washington, and a fish section set up in this Division under the Supervisor of Fish Resources.

These steps, together with the addition to the staff of a small corps of wildlife technicians who have initiated and supervised wildlife restoration projects undertaken by the Civilian Conservation Corps, have combined to accelerate the long-time conservation program of the Service.

Among projects completed are the construction of small reservoirs and the conservation of spring waters in the arid Southwest areas,

boundary fencing to protect game ranges, construction of fenced quadrates to facilitate range studies, installation of bear-proof devices, and the erection of storm and feed shelters for birds in eastern historical areas.

A number of study projects, involving species whose status is unsatisfactory, were under way. Outstanding among these is the bighorn study, prosecuted in Glacier, Yellowstone, Rocky Mountain, and Zion National Parks, and Death Valley National Monument. Little is known of bighorn habits and almost nothing concerning its continued decline.

A notable contribution to game management literature is *Wildlife Management in the National Parks*, no. 2 in the series, *Fauna of the National Parks of the United States*. The *Recreational Land Use* report of the National Resources Board, prepared in the National Park Service, places great emphasis upon the major place of a wildlife-restoration program in national recreational planning.

The present happy outlook for saving the trumpeter swan from extinction is the result of national planning. A few pairs, perhaps 10, nested in Yellowstone Park and on the nearby Red Rock Lakes, Mont. With all that could be done for these, the largest of American waterfowl, within the boundaries of the parks, the future remained precarious because of the losses through illegal shooting and lack of protection during the nesting season at Red Rock Lakes. The Interior Department publicized the trumpeter swan story and the Bureau of Biological Survey responded by setting aside the Red Rock Lakes Migratory Bird Refuge. This year there are more trumpeter swans nesting than before and with the elimination of wanton kills at Red Rock a total of more than 80 birds will probably survive the winter.

For a number of years Yellowstone has faced a critical situation due to overutilization of its limited winter range. The program to purchase additional lands to provide winter feed has progressed slowly. It was determined that the elk herd would have to be reduced by 3,000 animals before the winter of 1934-35. The Montana Fish and Game Commission was induced to extend the hunting season and most of the reduction was accomplished by hunters. Nevertheless it was necessary to slaughter a few hundred within the park. This was accomplished in an orderly manner, the meat going to Indian and relief agencies.

Glacier Park faces a similar situation in lack of winter range with consequent overutilization of the available feed. Last winter some deer were lost. A survey of this problem has been under way. Whereas the parks in past years have compensated lack of sufficient winter range by artificial feeding, experience has shown this to be an unsatisfactory method. Game herds artificially fed come through the winter in poorer condition than those left to forage for them-

selves, hence the service has adopted the policy that artificial feeding of native wild game shall be limited to conditions of extreme emergency.

In the interests of economy and administration, jurisdiction over the Wind Cave National Game Preserve was transferred to the National Park Service. Removal of the interior fences and other steps necessary to convert this operation into an exhibit of large game species in a natural environment are under way.

Addition to the national park system of the Dry Tortugas Islands, the area to be known as "Fort Jefferson National Monument", will contribute to the conservation of bird life, especially the sooty and noddy terns not known to nest elsewhere in the United States.

Fish culture hardly has been able to keep pace with the increase in parks fishing. Although no general improvement in this situation can be reported, a comprehensive study of the problems has been made and a constructive fish program evolved which should bring early results. Stream and lake surveys have been made and fish hatchery locations selected and emphasis placed upon the restoration of native game fish. An allotment has been secured for the construction of a fish hatchery at Glacier National Park. Throughout there has been the closest cooperation from the Bureau of Fisheries.

FOREST PROTECTION AND FIRE PREVENTION

The forest-protection and fire-prevention allotment under the regular appropriation act for the fiscal year 1935 permitted only very limited allotments to the parks to meet the barest needs for fire-protection personnel and equipment. As in the preceding fiscal year, all forest-protection improvements, insect and tree-disease control, and type mapping accomplished during the fiscal year were financed from the emergency appropriation, either under Emergency Conservation Work or Public Works. The forest protection accomplishments of the past year are, therefore, largely represented in the reports of the Emergency Conservation Work and Public Works programs. These programs made possible a continuance of the forest-protection development of the national parks and monuments far in advance of that which would have been possible under normal appropriations.

General administration of the Emergency Conservation Work program was handled through the Branch of Forestry by reason of the intimate relationship of that program with the protection of the national parks.

Forest-fire protection.—Despite the very severe fire season of 1934, resulting from a marked deficiency in precipitation during the pre-

vious winter, a very creditable fire record was established for the national parks and monuments. The presence of the Emergency Conservation Work camps was of immense assistance as a fire protection measure through the availability and use of the Civilian Conservation Corps enrollees for fire-patrol and fire-suppression service. In addition to the fires suppressed within the national parks, material assistance was rendered by the National Park Service Emergency Conservation Work camps to cooperating State and Federal fire protection agencies in suppression of fires on adjacent lands under their jurisdiction. In all, a total of 44,339 man-days' labor in fire suppression was furnished by Civilian Conservation Corps enrollees from National Park Service camps.

Mesa Verda National Park, in southwestern Colorado, which is normally free from severe fires, suffered the greatest fire damage of the season when a fire spread from the adjoining Ute Reservation during a period of exceptionally low humidity and strong, hot winds. A total of 2,229 acres was burned within park boundaries, with complete destruction of the pinyon and juniper stands through which the fire traveled. This is especially regrettable because of the slow recovery of the forest in that region of very light rainfall, and also because of the serious erosion following the removal of the vegetative cover.

Insect control.—Follow-up and maintenance insect-control activities were continued during the past year in several of the western national parks, the most important being the work undertaken in Yosemite and Sequoia National Parks.

The mountain pine-beetle infestation, which continues to spread throughout Yellowstone and Grand Teton National Parks and the surrounding national forest areas, became so serious that it was called to the attention of President Roosevelt during the spring of 1935, who expressed deep concern over the situation. It was agreed that the magnitude of the infestation precluded reasonable hope of successful control measures, but at the President's suggestion Public Works funds were provided for reforestation of scenic areas in the vicinity of tourist centers within Yellowstone National Park that have been and will be devastated by this wide-spread epidemic. As an initial step, funds were allotted for continuance of a type-mapping survey and for the establishment of a forest nursery in Yellowstone National Park, both of which will be highly essential in the reforestation program.

Blister rust control.—No new blister rust-control projects were initiated during the past year, but control operations were continued in Acadia and Mount Rainier National Parks and in the proposed Shenandoah National Park. The work in all three areas was accomplished by Civilian Conservation Corps enrollees.

Tree preservation and repair.—During the year the trees in three national cemeteries were given complete care from the standpoint of pruning, feeding, cabling, and girdling root removal, and the trees of greatest importance were given special cavity treatment where needed. This work was made possible by an allotment of Public Works Administration funds. Likewise work of a similar nature, except cavity work, was done in all military and historical parks and monuments, and in the National Capital Parks, with the use of Civilian Conservation Corps personnel. Eight high-powered sprayers were purchased and located at strategically placed Emergency Conservation Work camps to protect from insects and diseases trees in areas of historical importance or of intensive use.

Type mapping.—During the past year type-mapping projects in the East were completed in Colonial National Monument and in the proposed Shenandoah and Mammoth Cave National Parks, and similar projects were initiated in Acadia and Great Smoky Mountains National Parks. In the West the type-mapping field work was completed in Sequoia, General Grant, Zion, Bryce Canyon, and Mesa Verde National Parks and in Bandelier National Monument, and was initiated or resumed this spring in Yosemite, Yellowstone, Grand Canyon, and Glacier National Parks. Special effort is being made to complete as much of the type-mapping program as possible this season.

Fire protection for buildings.—The fire-protection engineer visited several of the eastern parks and monuments, recommended improvements, and instructed park employees in matters pertaining to fire hazards and fire equipment. The objective in this work is the safeguarding of life and property, including irreplaceable records, against fire. There was considerable activity during the year in the review of plans of buildings and water systems with respect to fire-protection standards.

LAND CHANGES IN PARK AND MONUMENT SYSTEM

Changes in the status of national park and monument lands during the past year were mainly in the direction of acquisition of acreage for addition to existing members of the system. No new national parks were created and but one national monument. The total number of areas now supervised by the National Park Service, exclusive of the National Capital parks, is 129, with a total area of 15,249,333.729 acres. There are 24 national parks, 1 national historical park, 68 national monuments, 11 national military parks, 10 battlefield sites, 4 miscellaneous memorials, and 11 national cemeteries.

The 683 reservations comprising the National Capital parks, with an area of 6,775.11 acres, are administered as a separate unit.

FORT JEFFERSON NATIONAL MONUMENT

On January 4, 1935, the Fort Jefferson National Monument, in the Portugas Keys off the southwestern coast of Florida, was established by Presidential proclamation. Its historic significance is the chief interest in the new monument.

LANDS ADDED TO EXISTING MEMBERS OF SYSTEM

Lands were added as follows to several members of the national park system to include areas of scenic, historic, and scientific importance:

Acadia National Park.—Total area increased to 13,956.49 acres by the donation of 124.25 acres to the Government.

Colonial National Monument.—The acquisition of 5.729 acres brought the total area to 4,250.029 acres.

Fort Matanzas National Monument.—Donation of 17.34 acres increased the total area to 18.34 acres.

Fredericksburg and Spotsylvania County Battlefields Memorial.—A total of 25.78 acres acquired. The total area within the Fredericksburg, Spotsylvania Courthouse, Chancellorsville, Salem Church, and Wilderness area now is 2,439.15 acres.

Hot Springs National Park.—Donation of 63.20 acres brought the total area to 1,008.99 acres.

Morristown National Historical Park.—Total area increased to 953.38 acres by the donation of 0.99 of an acre to the Government.

Muir Woods National Monument.—Donation of 1.36 acres increased total area to 427.79 acres.

Petersburg National Military Park.—Transfer of 1,461.72 acres from the War Department increased total area to 1,971.71 acres.

White Sands National Monument.—Addition of 158.91 acres by Presidential proclamation dated November 28, 1934, made total area 143,145.91 acres.

Private holdings.—In addition to the above acquisitions which served to increase total areas of parks and monuments, several private holdings within the exterior boundaries of park areas were eliminated, primarily through exchange of lands.

PROPOSED ADDITIONS TO THE NATIONAL PARKS SYSTEM

The broad program of planned use of our natural resources, including as it did the study of recreational land resources, has put a new emphasis on the investigation of areas having possible qualifications for addition to the park and monument system and the rounding out of areas already acquired. Two hundred and twenty-four areas which the Service has either investigated or plans to investigate are on the active list at present, and there are 17 major park and monument enlargement projects as well as a number of adjustments under consideration. Though Superintendent Toll, of

Yellowstone National Park, who is in charge of these investigations, has been active as usual, this year it has been necessary to supplement these studies. Preliminary investigation of many areas has been made by inspectors from the regional offices of the State Park E. C. W. As a result many areas unquestionably undesirable will be eliminated from the list and attention concentrated on others that indicate greater possibilities.

Mr. Toll's inspections covered 16 proposed areas, 4 of them being reported favorably.

Field work on a special project, the study of six large areas in and near the Colorado River Basin, conducted by Mr. Toll with the assistance of superintendents and technical men of the field branches in the Southwest, has been completed. The proposed creation of grazing districts under the provisions of the Taylor Grazing Act necessitated concentrating on these studies with a view to designating areas that should be excluded from the grazing act provisions. The Yampa Canyon, the Wayne Wonderland, the Organ Pipe Cactus, the Kofa Mountains, the Kolob Canyons, and the Colorado and Green Rivers were so designated. Recommendations for the establishment of specific areas either as parks or monuments will be forthcoming shortly.

The need for the conserving for the public benefit, of the finer beaches along the Atlantic, Pacific, and Gulf coasts, and the Great Lakes, was thrown into sharp relief by the studies of the National Resources Board. Sixteen proposed seashore recreation areas were studied, and it is recommended that early action be taken to establish the system of national beaches before all of these have passed into private hands or have been subdivided to a degree that would make their acquisition impracticable.

Proposed new parks and monuments and important proposed additions to those already established are discussed briefly below.

NATIONAL PARKS

Crater Lake.—Here is a park so small that it does not extend to the base of the mountain in whose crater the lake lies. In the protection of wildlife and primitive conditions, Crater Lake National Park is almost useless at present. It is proposed to add an area to the north now under the administration of the Forest Service, which contains Diamond Lake. If this additional land could be acquired, it would be possible to develop its rich recreational advantages to the end that overutilization to the consequent detriment of the rim of the crater itself would be prevented.

General Grant.—To secure administrative efficiency and integrity of the park from the topographic standpoint, small but important

additions to the east and south will be needed. The eastern addition would permit visitors to secure scenic outlooks both pleasing and valuable in orienting the General Grant Grove as to location along the Sierra.

Grand Canyon.—As at present constituted, north and south boundaries are too close to the canyon rim to provide for the perpetuation of timbered highlands, wildlife, and the complete range of life zones so intimately connected with the canyon story.

Grand Teton.—This important project to add lands of Jackson Hole needed for the protection of our country's largest elk herd and for the completion of this park as a scenic area has been long considered but always fails of accomplishment because of the complexities of the situation both as to public and private interests. Senate bill 2972 introduced in the Seventy-fourth Congress is not satisfactory to the Service because it omits Jackson Lake, the very heart of the picture. The Public Lands Committee will study the area, and it is hoped that the bill, satisfactorily amended, will soon be passed.

Hawaii.—Extensions to the southeast of the Kilauea-Mauna Loa section of the park would provide for the inclusion of a shore-line section. Such additions might even insure the perpetuation of one of the few unspoiled native villages that remain on the islands.

Hot Springs.—A proposed readjustment of boundary line to include all of West Mountain and Sugar Loaf Mountain, the northeast extremity of Sugar Loaf Mountain now being a segregated unit of the park, would permit the protection of an adequate biotic unit and the development of bridle and foot-path system for the recreational benefit of visitors to the springs.

Kings Canyon.—John Muir was the first to recognize the necessity of setting aside this region as a national park in the public interest. The Sierra Club for 30 years has worked energetically to this end. Never in all this time has the preeminent fitness of the area for inclusion in the National Park Service been questioned. The Forest Service, which has jurisdiction over the area, long has endorsed the park project. If established, this park would include the General Grant Park area.

Senate bill 2289 introduced in the Seventy-fourth Congress at the request of the Secretary of the Interior has met with the strong opposition of local interests, even though boundaries were carefully drawn to exclude any resources which might in the future be needed for the economic benefit of people living in that portion of the San Joaquin Valley watered by the Kings River. A conscientious effort is being made to demonstrate to the local people that a Kings

Canyon National Park would be beneficial to them as well as to the whole of the Nation.

Mesa Verde.—Lands now in an Indian reservation to the south and west of Mesa Verde are needed for the fulfillment of this park. The Service is cooperating with the Bureau of Indian Affairs and the Indians, in an effort to determine whether lands acceptable to the Indians can be found to exchange for the desired area.

Mount Olympus.—Mount Olympus National Monument until recently was under the administration of the Forest Service. Owing to its inaccessibility and the wealth of more accessible timber on the Olympic Peninsula, the monument was not developed and was practically unknown for many years. Twice its area was reduced, until now it is but half its original size. The timber resources of the remainder of the peninsula, however, have been steadily mined and devastated until today there is a strong demand to exploit the last remnant of the finest virgin forest of the Pacific Northwest immediately surrounding the Olympic Peaks.

House bill 7086 introduced in the Seventy-fourth Congress would establish Mount Olympus National Park to include lands now in Mount Olympus National Monument and a representative example of the forested lands in the Olympic National Forest adjacent.

Here again unsound logic is used to build the platform of a small but determined opposition. The last tree, like the last bison, so it is claimed, must be sacrificed to insure economic salvation.

Rocky Mountain.—A number of boundary changes, all of them involving either national forest or private lands and all important from an administrative standpoint, are needed. Grand Lake, the largest lake in Colorado and the west terminus of the recently constructed transmountain highway, should be included in the park. Extension to the south to include the Arapaho Glacier and Arapaho Peak, land of outstanding scenic quality, is also desired. Another proposal would connect the park with the segregated piece of land now containing the park administrative headquarters.

Sequoia.—Redwood Canyon and Redwood Mountain, just to the north of the present park, contain the largest remaining stand of giant redwoods. Incidentally, this is the largest pure stand to be found anywhere. On the south there is the Mineral King region, the upper watershed of the Kaweah River, which by all means should be added to the park.

Yosemite.—The Minaret region, originally within the boundaries of Yosemite, should be restored to the park. If done, this would consolidate the Devil Postpile National Monument with the present park.

Zion.—Kolob Canyons, already mentioned above as being included in the public domain survey in connection with the Taylor Grazing

Act, have had prior study by the Service. It is felt that this region is of outstanding quality and that it should be added to Zion National Park.

NATIONAL MONUMENTS

Many of the national monuments, notably those established some years ago, were created without due consideration of the area necessary for adequate approach and administration; consequently, the Service is greatly handicapped in their development. Plans now maturing call for careful investigation of this subject next winter.

Meanwhile recommendations can be made regarding some of them, as follows:

Black Canyon of the Gunnison.—The provision of a proper approach to this area and the development of its full use require considerable additions to the south and north.

Death Valley.—Though only recently established, Death Valley National Monument at once has become one of the most popular areas under the administration of the Service. In this extremely arid country, spring water is more important than anything else. Saratoga Springs to the south and a number of other springs should be included within the monument boundaries, as they are being rapidly preempted, with consequent damage to wildlife, especially the desert bighorn.

A petition to have the monument extended to the westward to include all of Panamint Valley has been presented to the Secretary and referred by him to the Service for study.

Dinosaur.—Consideration is being given to the addition of land for an approach to the monument and also the possibility of establishing a connection between this monument and the proposed Yampa Canyon National Monument, a short distance up the Colorado River in the State of Colorado.

Glacier Bay.—It is proposed to extend Glacier Bay National Monument on the west to the Pacific Ocean and on the south to Cross Sound and Icy Straits. These lands include coastal-stream habitats of the Alaska brown bear and an excellent stand of virgin timber, as well. The scenic quality is high.

Other monuments.—Among the national monuments that would benefit administratively from minor boundary revisions are Wupatki, Arches, Chiricahua, Devils Tower, El Morro, Fossil Cycad, Fort Pulaski, George Washington Birthplace, Scotts Bluff, Tonto, White Sands, Fort Jefferson, and Montezuma Castle. The desirability of other adjustments probably will be brought out in the survey to be undertaken next year.

NATIONAL MILITARY PARKS

The entire field of military parks, turned over to the Service in 1933, now is being carefully studied by the historians of the Service, and it is expected that several extensions will be recommended during the coming year.

STATUS OF NATIONAL PARK AND MONUMENT PROJECTS
AUTHORIZED BY CONGRESS

Shenandoah.—Deeds covering the minimum required area have been tendered. Acceptance of the lands by the Federal Government is contingent upon the clearance of title by the Department of Justice and the outcome of a suit pending in the Supreme Court of the United States on an appeal instituted by a landowner to test the constitutionality of the Virginia State condemnation law.

Isle Royale.—No active steps were taken during the year by the Isle Royale Park Commission, appointed by the Governor of Michigan, toward the acquisition of lands for the proposed Isle Royale National Park.

Mammoth Cave.—Deeds covering approximately 32,000 acres have been tendered by the State of Kentucky and are pending before the Department of Justice for examination as to the sufficiency of title to the lands involved. Also progress is being made toward the purchase of additional lands for the park with funds provided through the Work Relief Act of the Seventy-fourth Congress.

Everglades.—After an investigation of the area last winter the Service recommended that the park should include all the lands within the maximum boundary line specified in the act authorizing its establishment. The Governor of Florida has appointed a commission which is preparing a program to acquire the necessary lands for conveyance to the Government.

Big Bend.—The President signed the act authorizing the establishment of the Big Bend National Park in Brewster and Presidio Counties, Tex., within an area of approximately $1\frac{1}{2}$ million acres, contingent upon acquisition by donation of the private lands involved. It is expected that the boundary lines of this project will be defined in the near future, and a program of acquisition undertaken by the State.

Badlands.—The establishment of this monument under the terms of the authorization of Congress, approved March 4, 1929, is contingent upon acquisition by donation of the private lands, and upon the construction by the State of an approach highway. The State of South Dakota recently completed this highway, and has purchased all lands within the authorized boundary. Inasmuch as the boundary lines of the Badlands National Monument were specifically de-

fined by Congress, it was felt further authorization would be necessary to add these desirable lands. This authority is being sought in the Seventy-fourth Congress.

Ocmulgee.—This national monument was authorized by Congress in 1934 to preserve Indian mounds of great historical importance, contingent upon the donation of the lands involved to the United States. Local citizens of Macon, Ga., have been active in acquiring these lands. Four deeds have already been tendered to the Federal Government, and are in the hands of the Attorney General awaiting clearance of title.

Pioneer.—This project, authorized by Congress, would include four segregated areas which are of historical importance in connection with the movements of Daniel Boone, famous Kentucky pioneer. Establishment of the monument is dependent upon the donation to the Government of the necessary lands. No progress was made on the land acquisition.

Monocacy.—Establishment of the Monocacy National Military Park, in Maryland, was authorized by Congress, contingent upon the donation of the necessary lands to the Federal Government. The purpose of the establishment of this park is to preserve the site of the battle that resulted in saving the city of Washington from capture by the Confederate Army. As yet no progress has been made toward the acquisition of this land.

Kenesaw Mountain.—On June 26, 1935, the President signed the act changing the status of the Kenesaw Mountain battlefield site to the Kenesaw Mountain National Military Park and authorizing funds for its enlargement.

AREAS PROPOSED FOR TRANSFER FROM THE NATIONAL PARK SERVICE TO STATE OR OTHER AGENCIES

It has been recommended that the following areas be transferred to their respective States for administration as State reservations:

Lewis and Clark Cavern National Monument.—This monument was established by Presidential proclamation May 11, 1908. Funds have never been available for adequate maintenance of the cavern, and it has been necessary to keep the entrance locked to prevent vandalism. The Governor of Montana was approached regarding possible transfer of title to the State as a State park. He has informally signified his desire to assume the administration of the monument and with an ultimate transfer in mind a State park camp of the Civilian Conservation Corps has been assigned to develop it. Congressional legislation will be necessary to authorize this transfer.

Shoshone Cavern National Monument.—This monument, which was established by Presidential proclamation in 1909, has never been considered of outstanding national importance. The Cody Club of the nearby town of Cody, Wyo., has signified its desire to take over this cavern but wished to postpone such action until the present arrangements for the construction of an approach road by the bureau of public roads have been completed under agreement with the National Park Service, as the local government would find it impossible to construct this road at its own expense. Congressional action will also be necessary to transfer this monument.

ACQUISITION OF SUBMARGINAL LANDS FOR RECREATIONAL USE

The National Park Service continued its studies of submarginal lands with a view to recommending reallocation of certain areas as demonstration projects to provide low-cost recreational facilities for concentrated urban populations, especially the underprivileged group. Studies were made in each of the 48 States in cooperation with State planning boards and State park authorities. In general the projects, when completed, will be turned over to State agencies for administration. Several, however, needed to extend the present national-park and monument system, are being considered for retention in Federal control.

During the past year 58 recreational demonstration projects, located in 88 counties and involving 827,120 acres, were established or given preliminary approval for investigation. A total of 578,650 acres was appraised and 397,878 acres optioned. Twenty-two projects, which when developed will furnish recreational facilities to more than 20,000,000 people within a radius of 50 miles, were approved for acquisition and development, involving 339,650 acres at a cost of \$2,810,366. Of the more than 1,200 families living on the tracts proposed for purchase, about 250 will require financial assistance in rehabilitation or resettlement.

Thirteen Civilian Conservation Corps camps were established during the year to develop these demonstration projects, and plans call for the use in part of 31 camps in this connection during the 1936 fiscal year.

By Executive order of April 27, 1935, the general submarginal-land acquisition program, of which the recreational demonstration projects are an integral part, was transferred from the Federal Emergency Relief Administration to the Resettlement Administration of the Department of Agriculture.

PLANNING AND CONSTRUCTION ACTIVITIES

The fiscal year 1935 was characterized by an unusually extensive planning and construction program, due to the continuation of the Public Works and other emergency programs. Many projects entered the construction stage during the year, and the engineering and landscape personnel reached the point of stabilization where it is possible to produce the best work in the most efficient manner. Because of unemployment outside of the Government service, it has been possible to assemble a group of men of specialized training and wide experience, such as would not be available under normal circumstances in professional practice.

The availability of park master plans to guide new work has been of great assistance in this period of unusual construction activity. Never before has the Service been so completely supplied with plans for the future. Funds now are available for the drawing up of a master plan for the National Capital parks.

Federal projects, in addition to highway and parkway work handled for the National Park Service by the Bureau of Public Roads and reported elsewhere, consisted of directing, planning, constructing, or improving buildings, minor roads, trails, hydroelectric installations, Diesel-electric plants, electric elevators, dam and intake structures, reservoirs, pumping plants, water supply and distribution lines, drainage systems, sewers and sewage-disposal plants, telephone and power lines, cribbing, bridges and tunnels, retaining walls, and many other types of work.

The development of the eastern historic areas involved the preparation of general layout plans for the construction of administration and utility buildings. Important also in the physical improvements program were the restoration and reproduction of old landmarks and cherished shrines in the East, South, and Southwest.

Augmenting Federal construction activities, the western park operators started more new developments than at any time during recent years. All such projects required review and approval by Service architects.

Outstanding projects completed in the National Capital were the repair of the Washington Monument and the reconstruction of the Executive Offices of the White House. National Capital parks developments included restoration of Pierce Mill in Rock Creek Park and plans for the Rock Creek and Potomac and the George Washington Parkways and the completion of the Mall and Union Square; also the terminal developments for East Capitol Street involving a large stadium and armory.

PARK ROAD DEVELOPMENT

With the large grants of funds under the Public Works program, as well as under the Emergency Act appropriations of funds for park and monument roads and trails, reconstruction and relocation of park roads were continued to bring them to the standards necessary to bear the concentrated travel reaching them from transcontinental and other approach highways.

As in past years, the Bureau of Public Roads of the Department of Agriculture continued its excellent cooperation in major road construction in all areas administered by the National Park Service, with the exception of Mount McKinley National Park, Alaska, where road work has continued to be performed satisfactorily by the Alaska Road Commission.

The cooperative arrangement with the Bureau of Public Roads, as in former years, has been productive of noteworthy accomplishment under the direction of Thomas H. MacDonald, Chief of that Bureau.

PARKWAY PROJECTS

The development of parkways to connect widely separated scenic areas has shown marked progress. Three large-scale projects were studied during the year—the Green Mountain, the Shenandoah-Great Smoky Mountains, and the Natchez Trace Parkways. Field parties flagged a line from the Massachusetts-Vermont boundary to Jay Peak near the Canadian border to complete the Green Mountain survey, started in 1934. The Shenandoah-Great Smoky Mountains Parkway was 90 percent located and flagged, and bids were received for the construction of the first section of 12.5 miles south from the Virginia-North Carolina State line to Roaring Gap. An interesting feature in the planning of this parkway is the development of a group of areas along the route for scenic preservation and recreational use. The Natchez Trace Parkway survey, for which Congress authorized an appropriation of \$50,000, was well under way at the end of the fiscal year. This survey is being made to determine the feasibility of building a parkway to follow the old Indian trail known as the “Natchez Trace”, running from Nashville, Tenn., to Natchez, Miss., a distance of 500 miles.

PROGRESS OF HISTORIC AMERICAN BUILDINGS SURVEY

Started as a Civil Works project and organized to gather physical data on antique structures in the form of drawings and photographs, this architectural program was continued in the various States under Federal Emergency Relief Administration funds.

The survey has been carried on in close cooperation with the American Institute of Architects, and the material filed by special arrangement with the Library of Congress among its pictorial American archives. It has achieved a conspicuous success, as witnessed by the 4,960 drawings and 3,957 photographs added to the collection during the year. The material is of high quality, having been prepared according to exact specifications. In quantity the product probably exceeds all of the record material of this type previously gathered in this country.

EFFECTIVE USE OF RADIO IN PARK ADMINISTRATION

Radio communication is being used with outstanding success in many of the national parks, especially in connection with fire protection and general administration. During the past year this communication service was extended by the installation of new systems in Mesa Verde and General Grant National Parks and Mount Olympus National Monument. A few additional radio sets also were added in parks already equipped, as the need for additional facilities was demonstrated. Radio is now being used in most of the national parks where this method of communication has been found to be particularly adapted.

Experiments were made with small gas-engine generating units and storage batteries for remotely located stations to eliminate the use of dry batteries which require frequent replacement. Some experimentation has been made with short-wave sets to determine their advantages and limitations. A few sending and receiving sets have been installed in patrol cars.

The radio does not replace telephone service. Rather, it supplements that more widely-used type of communication in areas to which it is particularly suited. It is extremely effective as a means of communication at isolated winter stations at high elevations when overhead lines have been torn down by heavy snows or fallen trees.

SANITATION IN THE PARKS

In the handling of more than 6,000,000 visitors to the national parks and monuments in the course of a year, the National Park Service is faced with a serious responsibility to protect the public health through the provision of adequate sanitary safeguards.

Expansion of the park system in the East brought many added problems of sanitation. These were studied by sanitary engineers detailed from the Washington office of the Public Health Service. Their work consisted of the preparation of designs for sewage treatment facilities in Government buildings in the historic areas; survey

of mosquito-control work in the Colonial and George Washington Birthplace National Monuments; investigation of water supply and sewage disposal facilities in the Great Smoky Mountains and proposed Shenandoah National Parks; inspection of numerous projects under the jurisdiction of the National Capital parks; and examination of a number of bacteriological samples.

The Public Health Service continued its cooperation in supervising matters of sanitation in the western national parks and monuments, as it has for many years past, through its engineers stationed at San Francisco. General inspections of sanitary conditions were made in 17 national parks and 13 national monuments in the West, and plans were submitted for 16 sewage disposal plants, 4 water treatment plants, and 2 garbage incinerators. Bacteriological analyses were made of 389 samples of water from domestic water supplies in various parks and monuments. A general survey also was made of 7 State parks under development in Texas.

NEW INTERIOR BUILDING

A new building for the Department of the Interior has become a necessity because of crowded conditions in the present quarters. The Administrator of Public Works, with the approval of the President, allotted \$12,740,000 for the new building, which is to be located on Squares 144 and 145, northwest, bounded on the south by C Street, on the west by Nineteenth Street, on the north by E Street, and on the east by Eighteenth Street, and will be connected with the present building by a tunnel under Rawlins Square. The National Park Service handled the analysis of Department requirements and the preliminary plans. Waddy B. Wood, of Washington, D. C., is the architect. Plans and specifications for the building are under the jurisdiction of the Procurement Division of the Treasury Department, and the National Park Service acts as liaison bureau between the Treasury Department and the Interior Department. Demolition of buildings on the site is now under way and excavation is proceeding rapidly. The contract provides for the completion of the new building on December 17, 1936.

FEDERAL BUILDINGS MAINTAINED

The branch of buildings of the National Park Service at the close of the fiscal year operated and maintained 109 buildings, covering 16,000,000 square feet of floor space, and 7 memorials in the District of Columbia; and 9 buildings, amounting to over 500,000 square feet, outside of the District.

Because of the tremendous increase of work in connection with the installation of mechanical equipment in the new triangle build-

ings, the new central heating plant, and other Government buildings, a technical engineering division was created. The staff of five, including a chief engineer, and air-conditioning, structural, mechanical, and electrical engineers, renders expert advice and assistance in maintaining and operating the highly specialized equipment installed in these buildings.

Among the 40 Public Works improvement projects undertaken through an allotment of approximately \$3,000,000 were the following:

Additional repairs to the White House; completion of repairs to the Washington Monument and the Lincoln Memorial; continuance of restoration work at the Lee Mansion at Arlington; completion of the erection of the seventh story to the Interior Building; replacement of 10 obsolete elevators in the Interior Building; air conditioning the Interior Building; and installation of air-cooling systems in various Government-owned buildings in the District.

SPACE CONTROL PROGRAM

Continued creation and expansion of Federal emergency agencies added to the problems of the Division of Government Space Control, charged with the allotment of space to the various units in both Government-owned and leased buildings. During the fiscal year 137 leases were authorized, and 228 moves made. The rental bill of the Government in the District was at the rate of \$2,031,000 per annum.

In an effort to create additional office space a survey was made by the Division of Government Space Control of the quantity and character of files and storage of the various departments and agencies of the Government. As a result of this survey, it is expected that large units now occupied by files and storage may be transferred to less desirable space in storage buildings. Study and analysis of the space problem from an architectural standpoint are also being undertaken with a view to creating more space through suggested alterations or improvements. Everything possible is being done to remedy the congested conditions in Government offices, but there appears little relief in sight.

APPROPRIATIONS, DONATIONS, AND REVENUES

APPROPRIATIONS

Appropriations for the National Park Service during the fiscal year 1935 amounted to \$13,333,492. Of that amount, \$6,328,720 authorized in the Interior Department Appropriation Act, 1935, was supplemented by \$382,999 for completing salary restoration to em-

ployees on a 100-percent basis as provided by Public Resolution No. 3, Seventy-fourth Congress; \$816,873 was provided in the District of Columbia Appropriation Act, 1935; \$5,000,000 for road and trail construction and \$325,000 for an addition to the Executive Mansion were included in the Emergency Appropriation Act, fiscal year 1935; and a supplementary appropriation of \$479,900 for 1935 was made available in the Interior Department Appropriation Act, fiscal year 1936.

In addition, financing of construction activities was continued during the fiscal year under Public Works and Emergency Conservation Work allotments, as follows:

Public works, 1933-37

Construction of roads and trails.....	¹ \$25, 558, 303. 95
Construction of physical improvements.....	² 10, 899, 611. 32
Total.....	36, 457, 915. 27

Emergency conservation work, procurements from Apr. 22, 1933, to June 30, 1935

National parks.....	\$9, 560, 148
State parks.....	26, 639, 866
General Land Office.....	106, 430
Territory of Hawaii.....	751, 103
Reclamation Service.....	1, 064, 442
Soil erosion.....	2, 522, 303
Grazing control.....	1, 151, 000
Virgin Islands.....	91, 038
Drought relief, national parks.....	297, 700
Drought relief, State parks.....	2, 517, 400
California-Pacific National Exposition exhibit.....	9, 300
Total.....	44, 710, 730

CASH DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1935, amounted to \$589,200.69. The donations were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditure of Federal appropriations. In the 1934 fiscal year cash donations amounted to \$285,979.77.

REVENUES

The revenues received during the fiscal year 1935 amounted to \$907,189.96 as compared with revenues receipts of \$731,331.80 in the 1934 fiscal year.

¹ \$4,968,500 impounded by the Budget Bureau.

² \$31,500 impounded by the Budget Bureau.

APPROPRIATIONS, 1936 FISCAL YEAR

For the fiscal year 1936 there has been appropriated \$17,123,322. Of that amount, \$15,788,090 (including \$7,500,000 for road and trail construction) was authorized in the Interior Department Appropriation Act, 1936; \$898,000 in the District of Columbia Appropriation Act, 1936; and \$437,232 was made available in the Independent Offices Appropriation Act, 1936, for the Executive Mansion and grounds.

PUBLIC WORKS

The allocation of Public Works funds under title II of the National Industrial Recovery Act permitted continuation during the fiscal year 1935 of greatly needed road and trail construction work, as well as the various other types of physical improvements required in the administration, protection, and improvement of the areas under the jurisdiction of the National Park Service. By exercising care in the selection of projects and their geographical distribution, there resulted the greatest possible financial spread and maximum of relief to the unemployed in the vicinity of the far-flung areas administered by the Service in the United States, Hawaii, and Alaska.

The total allocation of Public Works funds for (1) road and trail projects and (2) physical-improvement projects to the end of the 1934 fiscal year, as compared with allocations for the same purposes for the fiscal year 1935, was as follows:

	Fiscal year 1934	Fiscal year 1935
Roads and trails.....	\$26,884,144.00	\$25,553,303.95
Physical improvements.....	7,232,456.27	10,899,611.32
Total.....	34,116,600.27	36,457,915.27

¹ Excludes \$1,000,000 canceled from previously authorized funds for parkway between the Shenandoah and Great Smoky Mountains National Parks.

The reflected increase of public works allotments in the fiscal year 1935 over the fiscal year 1934 is \$2,341,315. However, of the \$36,457,915.27 total indicated for 1935, \$5,000,000 of funds previously authorized has been impounded, and, unless this amount is released, the available public works allotments will total \$31,457,915.27. The impounded funds included \$3,990,000 previously authorized for the parkway between the Shenandoah and Great Smoky Mountains National Parks.

In addition to the public works allotments for construction of roads and trails, \$2,435,700 was authorized in the Interior Department Appropriation Act for the fiscal year 1934, and \$5,000,000 in the emergency appropriation act, fiscal year 1935.

ACCOMMODATIONS FOR THE PUBLIC FURNISHED BY PRIVATE CAPITAL

The Federal Government continued its policy of empowering private capital to operate, under franchise or permit, necessary accommodations in the national park and monument system for the visiting public, including lodging, meals, transportation, stores, and similar commercial enterprises.

The improvement in operators' revenues noted in last year's report continued during the 1935 fiscal year, with average gains approximating 25 percent above 1934. This is particularly encouraging in view of the fact that since 1930 the park operations in general have shown a loss. Even with the increase in revenues for the 1935 fiscal year, the total amount will be but about one-half of the 1929 revenues.

The very noticeable increase in rail travel, due to the use of air-conditioned equipment and the establishment of reduced rates to the West, resulted in an increased demand for bus transportation in and through the parks. It also resulted in an increase in the per-capita expenditure per visitor and in a demand for the better class of accommodations.

Continued careful supervision has been given to the business affairs of the park operators. Specific instructions were issued that only genuine hand-made Indian silverware could be sold in the parks, and the sale of imitations was prohibited. A decision was reached that the installation of nickel- or dime-catching devices add nothing to the interest or instruction of park visitors. Accordingly, no further permits for the installation of additional devices of this character are being granted, and those which have been installed will not be repaired or replaced but will be gradually eliminated. Instructions were issued forbidding the sale of souvenirs or curios of a type similar to or manufactured from materials of a character found in the national parks and monuments but which under the regulations visitors are not permitted to remove from such areas. Many of the reductions in rates which have been tried out experimentally during the past 2 years were made permanent.

The park operators met in conference in Washington on November 22, 1934, in conjunction with the meeting of the field officers of the Service. Many matters of common interest were taken up and discussed, the principal accomplishment being a clarification of the regulations governing the admittance of buses into the parks.

Because of the limited personnel available and the great increase in the volume of work, the following functions were transferred,

effective February 19, 1935, to the Division of Investigations, of the Secretary's Office:

1. Field examination of park operators' accounts to verify the correctness of annual reports submitted.
2. Detailed audit of the franchise fees paid or payable and of the priorities allowable and accumulated to the credit of national-park operators under the terms of their contracts with the Department.
3. Balance-sheet audit of the park operators' business and the certification to the Director as to the sufficiency of the system of internal audit or the acceptability of statements of certified public accountants in cases where complete and detailed audits are not made.
4. Investigation of irregularities in connection with the relations between the park operators and the Department.
5. Submission of appropriate recommendations relative to any matters within the purview of the field examinations and investigations.

CONCLUSION

The National Park Service faces the new year with a keen sense of satisfaction. It has missed no opportunity during the past 12 months to further the cause of national parks by taking advantage of the opportunities afforded by the emergency-work programs; it has sponsored legislation helpful in maintaining the national park and monument system for the benefit of the public; and has maintained with vigilance the integrity of park ideals and the policies of the Department of the Interior.

Perhaps the greatest problems facing it as the 1936 fiscal year commences are the rounding out of the scenic park system through the addition of a few new areas such as the proposed Kings Canyon National Park and the extension of existing areas such as the Mount Olympus National Monument and the Grand Teton National Park. It is hoped that pending investigations by a senatorial committee will serve to focus attention upon the true perspective of these problems and assist in bringing about a satisfactory solution.

Integration and expansion of the prehistoric and historic system under the enlarged historic-development program is another important activity facing the Service during the coming year, and one that will be prosecuted with vigor as funds and personnel are available.

As these enlarged programs are contemplated, assurances are given the American public that each step in the development of the national park and monument system will be planned with the utmost care and good faith, to the end that the great national heritage contained therein may be safeguarded for perpetual preservation.

NATIONAL PARKS TABLE 1.—*Holdings acquired by purchase, donation, and exchange for national park and monument purposes*

Parks and monuments	Holdings acquired from July 1, 1934, through June 30, 1935						Holdings acquired prior to July 1, 1934, in acres	Total holdings acquired through June 30, 1935, in acres
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase		Total area acquired in acres		
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park				(1)	124.25	124.25	13,832.24	13,956.49
Aztec Ruins National Monument							25.88	25.88
Black Canyon of the Gunnison National Monument							105.00	105.00
Carlsbad Caverns National Park							441.00	441.00
Chaco Canyon National Monument							3,832.86	3,832.86
Colonial National Monument	\$18,500.00		3.529	(1)	2.20	5.729	4,244.30	4,250.029
Colorado National Monument	496.25	\$496.25	222.50	(1)	426.70	649.20		649.20
Crater Lake National Park							1.00	1.00
Craters of the Moon National Monument							320.00	320.00
Fort Matanzas National Monument				(1)	17.34	17.34		17.34
Fredericksburg and Spotsylvania National Military Park	744.20		25.78			25.78	2,413.37	2,439.15
General Grant National Park							20.00	20.00
George Washington Birthplace National Monument							483.70	483.70
Glacier National Park	1,813.60	1,813.60	113.35			113.35	3,836.86	3,950.21
Grand Canyon National Park				(2)	11,614.91	11,614.91	19,228.94	30,843.85
Grand Canyon National Monument				(2)	506.83	506.83		506.83
Great Smoky Mountains National Park							394,088.35	394,088.35
Hawaii National Park							156,800.00	156,800.00
Hot Springs National Park				(1)	63.20	63.20	16.00	79.20
Lassen Volcanic National Park							40.00	40.00
Mesa Verde National Park							350.20	350.20
Morristown National Historical Park				(1)	.99	.99	952.39	953.38
Muir Woods National Monument				(1)	1.36	1.36	426.43	427.79
Petrified Forest National Monument				(2)	19,699.32	19,699.32	3,830.00	23,529.32
Pinnacles National Monument							1,926.27	1,926.27
Rocky Mountain National Park	50.00		.415			.415	5,096.14	5,096.555
Scotts Bluff National Monument							162.08	162.08
Sequoia National Park							3,294.25	3,294.25
Wind Cave National Park							100.77	100.77
Yellowstone National Park							3,266.07	3,266.07
Yosemite National Park							30,547.48	30,547.48
Zion National Park							1,561.39	1,561.39
Yucca House National Monument							9.60	9.60
Total	21,604.05	2,309.85	365.574		32,457.10	32,822.674	651,252.57	684,075.244

¹ Donation.² Exchange.

NATIONAL PARKS TABLE 2.—*Automobile and motorcycle licenses issued during seasons 1931-35*

Name of park ¹	1931		1932		1933		1934		1935	
	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles
Crater Lake.....	35,716	51	29,637	-----	19,924	-----	18,521	-----	24,297	-----
General Grant ²	7,397	-----	5,900	-----	6,199	-----	7,992	-----	4,199	-----
Glacier.....	11,562	-----	10,712	11	8,955	10	12,146	18	17,718	40
Grand Canyon.....	36,797	-----	32,651	-----	30,104	-----	28,721	-----	35,890	-----
Lassen Volcanic ³	-----	-----	4,803	3	4,924	9	6,859	7	6,437	8
Mesa Verde.....	4,863	-----	4,382	-----	4,262	-----	3,947	-----	4,177	-----
Mount Ranier.....	41,217	16	44,719	-----	31,903	-----	32,095	-----	37,801	-----
Sequoia ²	21,802	-----	18,304	-----	17,045	-----	17,401	-----	25,304	-----
Yellowstone.....	56,401	176	52,597	155	38,580	46	44,886	170	54,421	186
Zoemite.....	76,678	175	67,482	129	61,742	118	64,055	124	67,731	122
Yon.....	15,754	-----	12,967	-----	12,194	-----	14,352	-----	21,271	-----
Total.....	307,987	418	284,154	298	235,832	183	250,975	319	299,246	356

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks, because of small road mileage or unimproved condition of roads.

² Permits entrance to General Grant and Sequoia.

³ No license required prior to 1932 fiscal year.

NATIONAL PARKS TABLE 3.—*Receipts collected from automobile and motorcycles during seasons 1931-35*

Name of park ¹	1931	1932	1933	1934	1935
Crater Lake.....	\$35,803.00	\$29,687.00	\$19,924.00	\$18,521.00	\$24,297
General Grant ²	3,698.50	2,950.00	3,099.50	3,996.00	4,199
Glacier.....	11,362.00	11,092.00	8,965.00	12,164.00	17,758
Grand Canyon.....	36,950.00	32,764.00	30,104.00	28,721.00	35,890
Lassen Volcanic ³	-----	5,778.50	4,928.50	6,862.50	6,441
Mesa Verde.....	4,917.00	4,396.00	4,262.00	3,947.00	4,177
Mount Ranier.....	41,233.00	44,719.00	31,903.00	32,095.00	37,801
Sequoia ²	21,802.00	18,304.00	17,045.00	17,401.00	25,304
Yellowstone.....	169,379.00	156,537.00	115,786.00	134,828.00	163,449
Zoemite.....	153,531.00	135,831.00	123,602.00	128,234.00	135,584
Yon.....	15,400.00	12,976.00	12,194.00	14,352.00	21,271
Total.....	494,075.50	455,034.50	371,813.00	401,121.50	476,171

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² Permits entrance to General Grant and Sequoia.

³ No license required prior to 1932 fiscal year.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years ¹*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1928.....	\$37,940.00	\$37,376.99	-----
1929.....	39,000.00	40,014.00	-----
1929 (deficiency).....	1,355.00		-----
1930.....	52,600.00	48,701.52	-----
1931.....	59,900.00	56,984.42	-----
1932.....	61,600.00	59,892.14	-----
1933.....	59,400.00	57,602.08	\$10.00
1934.....	55,000.00	37,644.00	220.06
1935.....	41,470.00	41,627.57	265.00
1936.....	46,000.00	-----	-----

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Bryce Canyon:			
1930.....	\$26,100.00	\$21,580.01	.....
1931.....	13,700.00	13,700.00	.....
1932.....	20,000.00	² 19,257.50	.....
1933.....	14,800.00	12,455.43	.....
1934.....	13,790.00	7,211.00	.....
1935.....	10,490.00	10,402.28	.....
1936.....	12,000.00		.....
Carlsbad Caverns National Park:			
1928.....	30,000.00	28,492.84	\$55,682.00
1929.....	70,000.00	} 63,490.00	84,983.41
1929 (deficiency).....	260.00		
1930.....	100,000.00	² 103,271.01	136,241.78
1931.....	165,600.00	124,220.75	143,779.58
1932.....	150,100.00	² 130,162.62	113,677.43
1933.....	128,800.00	² 135,687.63	77,236.57
1934.....	68,330.00	49,356.00	89,730.54
1935.....	52,330.00	51,410.96	132,703.96
1936.....	64,000.00		.....
Crater Lake:			
1928.....	63,590.00	62,382.53	22,927.66
1929.....	47,100.00	} 61,464.00	24,318.22
1929 (deficiency).....	850.00		
1930.....	59,800.00	} 67,938.75	38,023.70
1930 (deficiency).....	12,000.00		
1931.....	⁴ 73,300.00	73,551.96	35,843.18
1932.....	106,900.00	106,753.64	29,687.00
1933.....	90,000.00	86,554.37	19,924.00
1934.....	63,479.00	53,838.00	18,937.35
1935.....	49,965.00	50,463.70	25,059.57
1935-36.....	5,000.00		.....
1936.....	57,600.00		.....
General Grant:			
1928.....	13,650.00	13,529.26	3,488.90
1929.....	15,650.00	} 15,802.00	3,305.70
1929 (deficiency).....	500.00		
1930.....	15,650.00	15,448.14	3,868.28
1931.....	15,860.00	15,841.07	3,989.95
1932.....	21,600.00	21,881.86	3,973.22
1933.....	21,900.00	20,913.85	3,437.16
1934.....	15,000.00	10,771.00	4,459.92
1935.....	11,750.00	11,504.01	4,229.00
1936.....	15,000.00		.....
Glacier:			
1928.....	163,300.00	162,525.28	14,652.56
1929.....	188,200.00	} 191,061.00	18,436.18
1929 (deficiency).....	5,065.00		
1930.....	219,400.00	} 215,726.91	22,146.16
1931.....	227,000.00		
1931 (deficiency).....	9,550.00	} 223,956.32	17,866.46
1932.....	256,500.00		
1933.....	226,200.00	² 246,002.11	17,495.56
1934.....	201,803.00	224,744.51	12,006.64
1935.....	153,435.00	143,724.00	16,235.36
1936.....	175,000.00	152,851.19	24,348.51
Grand Canyon:			
1928.....	128,760.00	128,268.33	46,097.43
1929.....	169,000.00	} 151,813.00	49,078.33
1929 (deficiency).....	3,540.00		
1930.....	145,000.00	141,389.56	55,684.46
1931.....	153,600.00	⁴ 171,670.11	51,497.05
1932.....	172,200.00	² 168,106.43	40,221.18
1933.....	150,000.00	142,656.15	32,933.93
1934.....	135,890.00	91,520.00	31,139.42
1935.....	102,400.00	101,064.44	43,544.90
1936.....	113,500.00		.....
Grand Teton:			
1929.....			25.00
1930.....			70.00
1931.....	30,700.00	29,048.47	20.00
1932.....	76,750.00	² 73,180.80	73.80
1933.....	29,900.00	26,243.06	45.00
1934.....	20,000.00	12,650.00	68.22
1935.....	15,620.00	14,716.34	77.71
1936.....	19,900.00		.....

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Great Smoky Mountains:			
1930-31 (deficiency).....	\$30,000.00	\$25,193.31	\$76.00
1932.....	30,000.00	² 29,682.77	5,220.55
1933.....	30,000.00	27,959.52	5,140.69
1934.....	28,430.00	17,024.00	4,795.00
1935.....	22,270.00	22,362.22	2,621.50
1936.....	59,900.00		
Lawson:			
1928.....	18,250.00	18,119.10	1,450.00
1929.....	21,500.00	21,070.00	1,477.00
1929 (deficiency).....	785.00		
1930.....	27,400.00	25,700.05	1,532.52
1931.....	35,800.00	35,439.55	1,500.00
1932.....	54,600.00	54,594.06	1,493.41
1933.....	51,100.00	50,095.20	482.46
1934.....	48,079.00	32,658.00	475.00
1935.....	37,125.00	35,486.46	475.00
1936.....	45,600.00		
Hot Springs:			
1928.....	69,800.00	67,433.19	47,695.50
1929.....	68,000.00	71,970.00	47,930.90
1929 (deficiency).....	6,320.00		
1930.....	70,900.00	69,173.28	47,931.33
1931.....	218,500.00	194,760.18	50,467.80
1932.....	89,300.00	² 86,110.72	43,243.22
1933.....	87,700.00	82,359.03	38,263.90
1934.....	82,680.00	58,979.00	30,456.00
1935.....	64,330.00	63,343.65	30,350.00
1936.....	71,200.00		
 Lassen Volcanic:			
1928.....	15,625.00	15,448.52	167.84
1929.....	22,400.00	22,688.00	34.36
1929 (deficiency).....	460.00		
1930.....	25,300.00	25,061.16	3,089.55
1931.....	30,500.00	29,007.20	61.59
1932.....	50,300.00	² 49,774.20	5,778.50
1933.....	45,100.00	43,310.99	4,980.96
1934.....	28,334.00	20,003.00	6,953.94
1935.....	22,635.00	⁴ 26,809.33	6,537.00
1936.....	28,400.00		
 Mesa Verde:			
1928.....	50,750.00	48,343.59	3,342.80
1929.....	83,000.00	47,134.00	4,719.00
1929 (deficiency).....	1,115.00		
1930.....	57,000.00	53,910.66	4,870.62
1931.....	96,800.00	³ 95,799.70	5,411.27
1932.....	57,300.00	² 55,724.49	5,011.75
1932 (deficiency).....	22,000.00	391,693.26	4,750.50
1933.....	72,900.00		
1934.....	52,509.00	39,654.00	4,224.50
1935.....	41,535.00	42,433.99	4,539.88
1936.....	47,250.00		
 Mount McKinley:			
1928.....	22,000.00	21,314.12	63.04
1929.....	35,900.00	36,165.00	1.00
1929 (deficiency).....	740.00		
1930.....	40,000.00	37,680.26	213.18
1931.....	46,700.00	42,686.45	292.00
1932.....	31,100.00	28,157.21	129.66
1933.....	35,600.00	32,165.49	25.00
1934.....	28,480.00	20,642.00	25.00
1935.....	22,270.00	22,394.40	83.70
1936.....	25,000.00		
 Mount Rainier:			
1928.....	108,000.00	105,447.74	32,495.50
1929.....	141,000.00	141,285.00	39,233.17
1929 (deficiency).....	3,370.00		
1929-30 (deficiency).....	2,500.00	125,214.00	41,530.31
1930.....	122,600.00		
1931.....	180,900.00	174,823.33	46,034.89
1932.....	195,000.00	263,233.48	48,793.27
1931-32 (deficiency).....	71,000.00		
1933.....	227,100.00	214,501.02	33,506.96
1934.....	143,884.00	103,795.00	34,158.65
1935.....	109,505.00	110,056.21	40,940.98
1936.....	121,800.00		

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
National Capital Parks:			
1934.....	\$787,000.00	\$778,839.00	* \$24,086.97
1935.....	816,873.00	857,136.97	28,992.02
1936.....	898,000.00		
Platt:			
1928.....	13,050.00	12,991.87	77.16
1929.....	18,000.00	19,053.00	33.05
1929 (deficiency).....	1,080.00		
1930.....	16,200.00	16,178.70	
1931.....	18,500.00	18,269.14	
1932.....	35,900.00	2 35,506.83	
1933.....	31,600.00	30,333.10	
1934.....	28,520.00	16,382.00	
1935.....	19,150.00	19,068.66	
1936.....	20,600.00		
Rocky Mountain:			
1928.....	97,620.00	95,612.07	924.15
1929.....	95,500.00	95,230.00	1,537.07
1929 (deficiency).....	2,380.00		
1930.....	96,000.00	94,871.34	4,471.24
1931.....	105,950.00	104,880.57	448.41
1932.....	118,800.00	2 117,909.55	749.52
1933.....	114,300.00	111,361.48	1,046.41
1934.....	98,007.00	75,305.00	409.21
1935.....	75,145.00	73,083.36	5,196.71
1936.....	82,000.00		
Sequoia:			
1928.....	109,000.00	108,863.10	35,105.81
1929.....	113,000.00	114,626.00	30,753.00
1929 (deficiency).....	3,440.00		
1930.....	130,000.00	130,056.49	33,934.54
1931.....	113,100.00	111,513.95	35,694.41
1932.....	156,900.00	156,713.93	33,010.31
1933.....	131,800.00	129,146.15	30,189.71
1934.....	113,317.00	86,483.00	34,164.91
1935.....	88,475.00	85,734.11	37,296.51
1936.....	99,500.00		
Shenandoah (proposed):			
1934.....	* 80,000.00		
1935.....	27,680.00		
1936.....	39,800.00		
Wind Cave:			
1928.....	10,850.00	11,500.00	12,725.51
1929.....	11,000.00	11,744.00	13,178.11
1929 (deficiency).....	760.00		
1930.....	13,500.00	13,442.51	16,715.01
1931.....	54,900.00	46,271.94	11,968.41
1932.....	25,200.00	2 68,074.68	7,258.61
1931-32 (deficiency).....	50,000.00		
1933.....	20,600.00	20,345.64	5,056.11
1934.....	18,160.00	13,386.00	4,239.91
1935.....	14,020.00	14,180.98	5,733.71
1936.....	15,900.00		
Yellowstone:			
1928.....	400,000.00	4 399,150.00	251,663.11
1929.....	434,000.00	5 443,230.00	289,388.91
1929 (deficiency).....	12,230.00		
1930.....	453,000.00	463,306.47	317,238.11
1930 (deficiency).....	17,000.00		
1931.....	501,275.00	500,026.39	259,723.31
1932.....	560,800.00	2 526,739.83	228,644.31
1933.....	530,800.00	497,681.85	149,853.81
1934.....	466,309.00	323,592.00	164,699.01
1935.....	350,265.00	354,961.51	217,854.41
1936.....	394,100.00		
Yosemite:			
1928.....	301,000.00	3 257,363.73	276,438.21
1928 (deficiency).....	15,000.00		
1929.....	387,250.00	4 449,159.00	237,166.91
1929 (deficiency).....	14,385.00		
1930.....	412,360.00	3 390,204.38	280,355.41
1930 (deficiency).....	5,381.00		
1931.....	510,100.00	574,302.64	260,805.21
1931 (deficiency).....	32,500.00		
1932.....	558,600.00	2 535,376.25	222,629.11

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Yosemite—Continued.			
1933.....	\$401,200.00	\$389,523.19	\$196,319.94
1934.....	335,309.00	205,227.00	221,960.83
1935.....	251,845.00	252,106.82	225,549.34
1936.....	286,100.00		
Zion:			
1928.....	30,900.00	30,937.69	3,106.50
1929.....	38,000.00	40,569.00	3,576.50
1929 (deficiency).....	3,295.00		
1930.....	38,300.00	42,290.11	7,724.01
1931.....	33,200.00	32,589.60	15,500.50
1932.....	54,100.00	53,145.65	13,067.30
1933.....	46,600.00	45,451.53	12,194.00
1934.....	47,440.00	32,646.00	14,539.35
1935.....	35,940.00	35,825.58	21,596.00
1936.....	39,800.00		
Colonial National Monument:			
1931-32 (deficiency).....	135,000.00	132,648.99	299.95
1933.....	72,000.00	53,615.41	504.92
1934.....	62,030.00	38,711.00	483.34
George Washington B. P. National Monument:			
1930 (deficiency).....	996.18	987.71	
1930-31 (deficiency).....	80,000.00	78,782.34	
1931.....	2,500.00		
1932.....	26,500.00	26,050.83	1.00
1933.....	25,800.00	22,661.61	20.00
1934.....	21,250.00	11,468.00	
National Historical Parks and Monuments:			
1935.....	77,350.00	73,710.11	743.04
1936.....	92,300.00		
National Monuments:			
1928.....	25,000.00	24,042.56	132.00
1929.....	35,000.00	35,951.00	97.00
1929 (deficiency).....	1,225.00		
1930.....	46,000.00	42,634.76	100.00
1931.....	83,900.00	71,598.75	269.60
1931 (deficiency).....	3,000.00		
1932.....	165,400.00	147,585.89	195.19
1933.....	93,800.00	86,978.64	252.05
1934.....	89,060.00	57,457.00	185.03
1935.....	82,760.00	79,115.63	355.39
1936.....	111,660.00		
National Military Parks, Battlefields, and Cemeteries:			
1934.....	229,883.00	135,464.00	306.67
1935.....	160,030.00	141,971.43	1,635.00
1936.....	239,600.00		
National Military Monuments:			
1934.....	36,223.00	25,658.00	575.00
1935.....	33,770.00	31,052.05	717.30
National Park Service:			
1928.....	57,100.00	57,047.56	20.10
1929.....	70,200.00	75,714.00	
1929 (deficiency).....	4,660.00		
1930.....	80,830.00	81,864.36	.25
1931.....	117,000.00	115,859.20	
1932.....	167,400.00	165,299.20	
1933.....	174,620.00	174,547.94	1.14
1934.....	160,000.00	143,069.00	10.00
1935.....	148,390.00	148,369.76	30.00
1936.....	175,380.00		
Public Buildings and Grounds:			
1934.....	3,479,193.00	3,396,605.00	23,774.23
1935.....	4,078,590.00	4,835,163.99	45,913.70
1935 (appropriated in 1936).....	479,900.00		
1936.....	5,615,000.00		
Arlington Memorial Bridge:			
1934.....	198,000.00	57,025.00	
Addition to Executive Office building:			
1935 (deficiency).....	325,000.00		
Fighting forest fires:			
1922.....	25,000.00	9,618.30	
1923.....	25,000.00	17,764.16	
1924.....	25,000.00	6,526.02	
1925.....	20,000.00	20,000.00	

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
General expenses, National Park Service:			
1931.....	\$25,000.00	\$24,993.02	-----
1932.....	35,100.00	31,904.58	-----
1933.....	37,000.00	33,914.87	-----
1934.....	25,000.00	24,685.00	-----
1935.....	24,500.00	13,681.96	-----
1936.....	25,000.00	-----	-----
Forest protection and fire prevention:			
1931.....	96,850.00	95,856.95	-----
1932.....	170,000.00	*167,247.75	-----
1933.....	140,000.00	132,491.82	-----
1934.....	147,000.00	108,580.00	-----
1935.....	69,600.00	59,675.46	-----
1935-36.....	75,000.00	-----	-----
Emergency reconstruction: 1925.....	20,000.00	17,009.15	-----
Emergency reconstruction and fighting forest fires:			
1926.....	\$40,000.00	\$80,000.00	-----
1926 (deficiency).....	40,000.00		-----
1927.....	40,000.00	40,000.00	-----
1927 (deficiency).....	235,000.00	228,647.83	-----
1928.....	40,000.00	26,865.46	-----
1929 (deficiency).....	29,000.00	*40,138.26	-----
1930.....	20,000.00	180,300.17	-----
1930 (deficiency).....	180,000.00		-----
1931.....	50,000.00	40,481.49	-----
1932.....	50,000.00	*169,950.35	-----
1932 (deficiency).....	55,000.00		-----
1933.....	50,000.00	*57,228.83	-----
1934.....	50,000.00	35,407.00	-----
1934 (deficiency).....	100,000.00		-----
1935 (deficiency).....	25,000.00	-----	-----
Construction of roads and trails:			
1925 (deficiency).....	1,000,000.00	1,000,000.00	-----
1926.....	1,500,000.00	1,500,000.00	-----
1927.....	2,000,000.00	2,000,000.00	-----
1928.....	2,000,000.00	2,000,000.00	-----
1928 (deficiency).....	1,000,000.00	1,000,000.00	-----
1929.....	2,500,000.00	2,500,000.00	-----
1930.....	5,000,000.00	5,000,000.00	-----
1931.....	5,000,000.00	7,500,000.00	-----
1931 (deficiency).....	2,500,000.00		-----
1932.....	5,000,000.00	5,000,000.00	-----
1933.....	4,500,000.00	4,500,000.00	-----
1934.....	2,435,700.00	1,477,200.00	-----
1936.....	7,500,000.00	-----	-----
Emergency construction, roads and trails:			
1931 (deficiency).....	2,078,800.00	2,078,800.00	-----
1933.....	3,000,000.00	3,000,000.00	-----
1935 (deficiency).....	5,000,000.00	2,367,413.00	-----
Insect control:			
1925-26 (deficiency).....	25,000.00	24,945.24	-----
1927.....	20,000.00	19,828.96	-----
1928.....	7,500.00	7,379.35	-----
Southern Appalachian:			
1925-26 (deficiency).....	20,000.00	12,453.27	-----
1927.....	(3)	7,252.21	-----
1928.....	5,000.00	*3,887.13	-----
1929.....	4,500.00	*3,945.07	-----
1930.....	3,000.00	*3,415.75	-----
1931.....	3,000.00	*4,172.45	-----
Purchase of lands:			
1928.....	50,000.00	13,925.00	-----
1929.....	50,000.00	1,383.00	-----
1930.....	250,000.00	17,233.93	-----
1931.....	1,750,000.00	*1,983,718.06	-----
1932.....	1,000,000.00	*711,688.33	-----
1933.....	-----	*238,396.19	-----
Extension of winter-feed facilities:			
1930.....	75,000.00	7,612.50	-----
1931.....	75,000.00	10,265.00	-----
1932.....	-----	*12,022.50	-----
1933.....	-----	*477.50	-----
Purchase of lands Colonial National Monument:			
1931-32 (deficiency).....	500,000.00	500,000.00	-----

See footnotes at end of table.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Public works projects, roads and trails: 1933-37.....	\$25,544,003.95	\$18,503,983.95	-----
Public-works projects, physical improvements: 1933-37.....	10,911,411.32	9,593,490.32	-----
Federal Emergency Relief, 1935.....	396,819.72	396,819.72	-----
Emergency conservation work: 1933-37 (allotments program).....	48,654,313.00	36,916,746.93	-----
Civil works, 1933-35.....	2,490,678.00	2,490,678.00	-----
Commission of Fine Arts: 1935.....	9,390.00	9,042.03	-----
1936.....	9,700.00	-----	-----
Big Dry Wash Battlefield: 1936.....	500.00	-----	-----
Perry's Victory Memorial: 1936.....	4,000.00	-----	-----
Mount Rushmore National Memorial Commission: 1936.....	55,000.00	-----	-----

¹ For statement of appropriations and revenues prior to 1917 see 1920 Annual Report, pp. 354-358, and for 1918-27 see 1930 Annual Report, pp. 66-72.

² Appropriation decreased by transfers to emergency reconstruction and fighting forest fires under authority contained in the appropriation act.

³ Reappropriated items. (See table 5.)

⁴ Appropriation augmented by transfers from other appropriations under 10-percent clause.

⁵ Credited to the miscellaneous receipts in the District of Columbia.

⁶ Funds lapsed. Park not established in specified time.

⁷ Available until expended.

NATIONAL PARKS TABLE 5.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reappropriated for fiscal year	Park	Amount	Purpose
1928.....	1929	Yosemite.....	\$35,000.00	Hospital building.
1928.....	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928.....	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929.....	1930	Yosemite.....	8,661.78	Construction of water-supply and camp-ground facilities.
1929.....	1930	Carlsbad Caverns.....	4,950.00	Superintendent's residence.
1929.....	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929.....	1931	Grand Canyon.....	20,000.00	Hospital building.
1930.....	1931	Acadia.....	2,550.00	Equipment storage building.
1930.....	1931	Crater Lake.....	1,091.06	Ranger station.
1930.....	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930.....	1931	Yosemite.....	32,662.70	Physical improvements.
1930.....	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930.....	1931	Southern Appalachian.....	1,246.80	To remain available; general.
1930.....	1931	Glacier.....	9,550.00	One-third of cost of constructing a telephone line.
1931.....	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931.....	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931.....	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932.....	1933	Carlsbad Caverns.....	13,000.00	Electric system, extension and improvement.
1932.....	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.
1933.....	1934	do.....	9,143.93	Do.
1934.....	1935	do.....	75,000.00	Do.

NATIONAL PARKS TABLE 6.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917¹ to 1935, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department..... War Department.....	\$537,366.67 247,200.00	
		\$784,566.67	\$180,652.30
1918	Interior Department..... War Department.....	530,680.00 217,500.00	
		748,180.00	217,330.55
1919	Interior Department..... War Department.....	963,105.00 50,000.00 50,000.00	
		1,013,105.00	196,678.03
1920	.....	907,070.78	316,877.96
1921	.....	1,058,969.16	396,928.27
1922	.....	1,433,220.00	432,964.89
1923	.....	1,446,520.00	513,706.36
1924	.....	1,892,601.00	663,886.32
1925	.....	3,027,657.00	670,920.98
1926	.....	3,258,409.00	826,454.17
1927	.....	3,698,920.00	703,849.60
1928	.....	4,889,685.00	808,255.81
1929	.....	4,754,015.00	849,272.95
1930	.....	7,813,817.18	1,015,740.56
1931	.....	12,113,435.00	940,364.79
1932	.....	12,831,250.00	820,654.19
1933	.....	10,640,620.00	628,182.06
1933-35	.....	53,402,249.00	
1934	.....	10,983,089.00	731,331.80
1935	.....	12,461,513.00	907,189.96
1936	.....	16,686,090.00	

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.

² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 7.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act. Dec. 5, 1924; 43 Stat. 686.....	1925	\$1,000,000		\$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179.....	1926	1,500,000	\$1,000,000	2,500,000
Act May. 10, 1926; 44 Stat. 491.....	1927	2,000,000	\$1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966.....	1928	2,000,000	\$2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19.....		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237.....	1929	2,500,000	\$4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601.....	1930		\$2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319.....		5,500,000		
Act Dec. 20, 1930; emergency construction.....	1931	1,500,000	\$2,500,000	
Emergency construction funds transferred by the President.....		578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115.....	1932	5,000,000	\$2,850,000	
Second Deficiency Act 1931; Mar. 4, 1931.....		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127.....	1933	4,500,000	\$2,500,000	7,150,000
Emergency construction and relief.....		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853.....	1934	2,435,700		64,300
Emergency construction.....	1935	5,000,000		5,000,000
Act May 9, 1935; Public, No. 53, 74th Cong.....	1936	7,500,000		7,500,000
Total appropriated.....		52,014,500		
Total program to date.....				52,014,500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

NATIONAL PARKS TABLE 8.—Forest-fire statistics, calendar year 1904

Park	Classification			Point of origin			Burned area inside parks (nearest whole acre)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)									
	A	B	C	Total	Inside parks		Outside parks	Timber	Brush	Grass	Total	Government	Private	Total	Personal services		Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees not paid from F. F. F.	Grand total	C. C. C. man-days contributed ¹
					On Government land	On private land									Entered park	Confined to outside areas							
	1/4 acre or less	Between 1/4 and 10 acres	10 acres or over	All classes, A, B, and C	Concluded to outside areas																		
Acadia.....	No.	5	1	6	2	4	4	4	4	4	4	10	0	10	10	1	0	1	0	1	1	2	564
Bryce Canyon.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Carlsbad.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Crater Lake.....	8	2		10	9	1	3	3	3	3	3	0	0	0	0	1	0	1	0	1	0	1	54
General Grant.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Glacier.....	25	7	5	37	31	3	1	2	202	30	232	32	32	32	32	1,121	4,583	1,065	786	7,555	381	7,936	4,323
Grand Canyon.....	16	13	1	30	26	4	4	27	2	1	30	20	20	20	20	29	81	9	64	183	112	295	241
Grand Teton.....	7	1	2	10	6	4	1	1	1	1	1	2	2	2	2	23	15	29	6	44	29	73	4,286
Great Smoky.....	8	10	1	19	11	2	5	280	60	39	379	4	4	2	6	55	0	0	55	55	41	96	1,855
Hawaii.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Springs.....	1	1		2	1	1					0	0	0	0	0	0	0	0	0	0	0	0	0
Lassen.....	16	2	2	20	16	4	4	2	2		4	13	13	13	13	1,673	2,614	924	5,890	11,101	95	11,714	2,467
Mesa Verde.....	2	1	2	5	4	1	1	1,363	866		2,229	0	0	0	0	192	1,382	3,625	0	5,199	132	5,331	3,045
Mt. Rainier.....	5		1	6	6			633			633	0	0	0	0	0	0	0	0	0	0	0	0
Mt. McKinley.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Platt.....	3			3	3						0	0	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain.....	6	2	1	9	7	1	1	8	20	20	48	2	2	2	2	16	33		16	65	84	149	123
Sequoia.....	30	4	7	41	33		8	71	240		311	5	5	5	5	18	193	1,341		1,552	479	2,031	10,184
Wind Cave.....				0							0	0	0	0	0	0	0	0	0	0	0	0	0
Yellowstone.....	28	7	4	39	38	1	1	499	13	31	543	1,247	1,247	1,247	1,247	332	1,637	1,661	254	3,884	745	4,629	1,895
Yosemite.....	28	13	2	43	41	1	1	76	415	76	491	73	73	73	73	30	88	20	138	310	448	12,540	
Zion.....	1		1	2	1			18	14	14	32	10	10	10	10		15		15	15	41	56	43

¹ Includes time of C. C. C. enrollees spent in suppression of forest fires both inside and outside of parks.² Fighting forest fires outside parks: Grand Teton, 4,200 man-days; Yosemite, 10,703; and Sequoia 8,370.

NATIONAL PARKS TABLE 8.—*Forest-fire statistics, calendar year 1934*—Continued

Park	Classification				Point of origin		Burned area inside parks (nearest whole acre)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)								
	A	B	C	Total	Inside parks		Outside parks	Timber	Brush	Grass	Total	Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees not paid from F. F. F.	Dol- lars	No.
					On Government land	On private land																	Entered park	Confined to outside areas
	No.	No.	No.	No.	No.	No.	No.	Acres	Acres	Acres	Acres	Mbf.	Mbf.	Mbf.	Dol- lars	Dol- lars	Dol- lars	Dol- lars	Dol- lars	Dol- lars	Dol- lars	No.
Shenandoah.....	9	12	10	22	21	11	1	741	269	115	1,010	2,250	4	4	0	0	0	0	0	250	1,401	420
Mammoth Cave.....		19	9	37	13	13		290	4	4	405	2,250								11	5	45
Morris town.....		1	1	2	1	2		66			66											
Chickamauga-Chattanooga.....		1	1	2	2	2		200	100	300	600											
Gettysburg.....	4	1	2	3	4	1		52			56											
Petersburg.....	2	4	2	8	5	3		3			3											
Shiloh.....	3	2	2	7	3	1		1			2											
Vicksburg.....	7	2	2	9	6	3		20			20											
Bandelier.....	1	1	1	3	2	2		2			2											
Colonial.....					1	1																
Death Valley.....		1	1	2	2	2		2			3											
Devils Tower.....	1	1	1	3	2	2																
Lava Beds.....	1	1	1	3	2	2																
Muir Woods.....	1	1	1	3	1	1		1			100											
Pinnacles.....	1	1	1	3	1	1																
Total.....	205	108	66	379	297	24	11	4,545	2,101	567	7,213	3,679	2	3,681	3,634	10,601	8,723	7,050	30,008	3,412	33,420	44,339

Park	Causes of fires										Classification of fires according to cost of suppression (Includes only those fires which burned inside park boundaries)									
	Light- ning	Camp fires	Smok- ers	Debris burn- ing	Incen- diary	Lum- ber- ing	Rail- roads	Mis- cella- neous	Total man- caused	Grand total	\$25 and under	\$26 to \$50	\$51 to \$100	\$101 to \$200	\$201 to \$500	\$501 to \$1,000	\$1,001 to \$2,000	\$2,001 to \$5,000	Over \$5,000	Total
Acadia.....	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Bryce Canyon.....	6								6	6										2
Carlsbad.....									0	0										0
Crater Lake.....	7			1				2	3	10	9									0
General Grant.....									0	0										0
Glacier.....	5	4	21	4	2			1	32	37	27			1		1				35
Grand Canyon.....	24		5	1				6	30	30	22	4								26
Grand Teton.....	3	1	5		7	1		7	10	7	6									6
Great Smoky.....			3	5				2	18	18	13	3		2						18
Hawaii.....									0	0										
Hot Springs.....				1				1	1	1	1									1
Lassen Volcanic.....	12	1	5		2			8	20	20	16									16
Mesa Verde.....	3							1	2	5						1				5
Mt. Rainier.....	1		5		1			5	6	6	5								1	6
Mt. McKinley.....									0	0										0
Platt.....			2	1				1	3	3	3									3
Rocky Mountain.....	3	2	2		1			1	6	9	5	1	1							8
Sequoia.....	18	4	12	2	1			4	23	41	23	3	1	3	2	1				33
Wind Cave.....									0	0										0
Yellowstone.....	18	8	10	3					21	39	27	4	1	2	2		3			39
Yosemite.....	22		19	1				1	21	43	39	1				1				43
Zion.....	1									1	1									1
Shenandoah.....	1	1	1	1	15			3	21	22	11	3	2	3	2	1				1
Mammoth Cave.....			4	5	21			7	37	37	26									22
Morristown.....			1					1	1	1										1
Chickamauga-Chat- ta-nooga.....									2	2	2									2
Gettysburg.....			1	2		1		4	4	4	4									4
Petersburg.....			1		1	1		3	3	3										1
Shiloh.....			1	1				1	8	8					1					5
Vicksburg.....			1	6				1	5	5	5									5
Bandelier.....			2	1	1		1		6	9	6									6
Colonial.....	7		2					2	2	2	1									2
Death Valley.....			1	1				1	1	1		1								1
Devils Tower.....			1					2	2	2	1									2
Lava Beds.....			1	1	1			1	1	1		1								2
Muir Woods.....		1							1	1	1									2
Pinnacles.....			1						1	1	1									1
Total.....	127	23	115	35	52	2	1	24	252	379	266	21	12	12	9	4	5	1	2	332

NATIONAL PARKS TABLE 9.—*Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, July 1, 1934, to June 30, 1935*

Item	Unit	Total work accomplished from July 1, 1934, to June 30, 1935			
		New construction			Maintenance
		National parks and monu- ments	State parks	Combined total national parks and State parks	
Foot bridges.....	Number.....	77	512	589	
Horse bridges.....	do.....	16	94	110	9
Vehicle bridges.....	do.....	44	365	409	58
Buildings:					
Barns.....	do.....	13		13	1
Bathhouses.....	do.....		5	5	
Cabins, overnight.....	do.....		73	73	
Combination.....	do.....		7	7	
Contact station.....	do.....	2	5	7	1
Dwellings.....	do.....	75	9	84	351
Equipment and supply storage houses.....	do.....	12	51	63	2
Garages.....	do.....	6	9	15	6
Latrines and toilets.....	do.....	53	644	697	5
Lodges.....	do.....		6	6	2
Lookout:					
Houses.....	do.....	7	78	85	
Towers.....	do.....	7	29	36	
Museums.....	do.....	1	2	3	
Shelters:					
Trail-side.....	do.....		35	35	
Other.....	do.....		50	50	
Other buildings.....	do.....	178	5,021	5,199	11
Cribbing, including filling.....	Cubic yards.....	335	652	987	
Dams:					
Impounding and large diversion.....	Number.....	1	89	90	
Concrete.....	Cubic yards.....		5,998	5,998	
Fill:					
Earth.....	do.....	675	160,221	160,896	
Rock.....	do.....		8,303	8,303	
Excavation:					
Earth.....	do.....		37,470	37,470	
Rock.....	do.....		27,765	27,765	
Masonry.....	do.....	2	3,541	3,543	
Riprap.....	Square yards.....	130	29,817	2,9,947	
Steel.....	Pounds.....		567,726	567,726	
Fences.....	Rods.....	45,561	22,238	67,799	13,641
Guard rails.....	do.....	2,451	33,610	36,061	949
Levees, dikes, and jetties.....	Cubic yards.....		2,085	2,085	
Power lines.....	Miles.....	.6	13	13.6	
Disposal:					
Beds.....	Square yards.....		7,686	7,686	
Tanks and cesspools.....	Number.....	5	349	354	5
Incinerators.....	do.....	1	121	122	
Sewer lines.....	Linear feet.....	11,195	192,033	203,228	2,100
Other sewage and waste disposal.....	Man-days.....	349	1,992	2,341	
Telephone lines.....	Miles.....	340.2	384.6	724.8	2,019
Drinking fountains.....	Number.....		30	30	
Open ditches.....	Linear feet.....	300	16,250	16,550	
Water pipe or tile lines.....	do.....	132,692	825,741	958,433	50,248
Springs, water holes, small reservoirs.....	Number.....	87	37	124	13
Water storage facilities (omit last 000).....	Gallons.....	84	8,415	8,499	5
Wells, including pumps and pump houses.....	Number.....	9	154	163	2
Water supply systems, other.....	Man-days.....	49	2,956	3,005	
Camp stoves or fireplaces.....	Number.....	40	611	651	
Cattle guards.....	do.....	17	2	19	
Corrals.....	do.....	11	4	15	8
Portals.....	do.....	1	17	18	
Seats.....	do.....	51	171	222	
Signs, markers, and monuments.....	do.....	598	980	1,578	346
Stone walls.....	Rods.....	658	968	1,626	
Table and bench combinations.....	Number.....	112	865	977	
Tool boxes.....	do.....	75	469	544	6
Miscellaneous structural improve- ments.....	do.....	1,090	11,464	12,554	6

NATIONAL PARKS TABLE 9.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, July 1, 1934, to June 30, 1935—Continued

Item	Unit	Total work accomplished from July 1, 1934, to June 30, 1935			
		New construction			Maintenance
		National parks and monuments	State parks	Combined total national parks and State parks	
Truck trails.....	Miles.....	458.3	979.4	1,437.7	592.4
Minor roads.....	do.....	113.4	-----	113.4	375.2
Highways.....	do.....	-----	-----	-----	2,461.1
Park roads.....	do.....	-----	334.4	334.4	-----
Foot trails.....	do.....	150.4	603.2	753.6	234.4
Horse trails.....	do.....	493.5	347.2	840.7	1,041.1
Stream and lake bank protection.....	Square yards.....	845,585	1,612,681	2,458,266	4,588
Treatment of gullies—Area treated.....	Acres.....	3,767.6	20,016	23,783.6	34.2
Bank sloping.....	Square yards.....	131,452	455,603	587,055	5,202
Check dams:					
Permanent.....	Number.....	3,450	283	3,733	18
Temporary.....	do.....	935	990	1,925	4
Seeding and sodding.....	Square yards.....	113,080	798,137	911,217	77,864
Tree planting, gully.....	do.....	9,761	87,785	97,546	33,880
Ditches, diversion.....	Linear feet.....	2,355	13,631	15,986	6,000
Terracing.....	Miles.....	.1	2.4	2.5	-----
Channel excavation or construction.....	Linear feet.....	-----	107,531	107,531	-----
Sheet erosion planting.....	Acres.....	-----	235	235	-----
Limestone quarrying.....	Tons.....	-----	4,765	4,765	-----
Miscellaneous erosion control work.....	Man-days.....	-----	34,512	34,512	-----
Clearing and cleaning, channels.....	Square yards.....	-----	421,197	421,197	-----
Clearing and cleaning, reservoir sites.....	Acres.....	-----	1,693.6	1,693.6	-----
Excavation:					
Earth.....	Cubic yards.....	17,457	259,438	276,895	-----
Rock.....	do.....	505	7,118	7,623	-----
Pipe lines and conduits.....	Linear feet.....	2,100	-----	2,100	-----
Riprap or paving:					
Rock or concrete.....	Square yards.....	2,910	22,087	24,997	-----
Brush or willows.....	do.....	-----	3,330	3,330	-----
Water control structures:					
Concrete or masonry.....	Cubic yards.....	32	1,092	1,124	-----
Wooden.....	Feet board measure.....	207,439	1,116	208,555	-----
Number.....	Number.....	16	40	56	-----
Field planting or seeding (trees).....	Acres.....	4,420.7	12,517.8	16,938.5	1,571.2
Forest stand improvement.....	do.....	992	25,332.3	26,324.3	8
Nurseries.....	Man-days.....	14,387	40,658	55,045	164
Tree seed collection:					
Conifers (cones).....	Bushels.....	15	805	820	-----
Hardwoods.....	Pounds.....	1,426	42,879	44,305	-----
Fighting forest fires.....	Man-days.....	47,463	71,674	119,137	-----
Firebreaks.....	Miles.....	194.6	801.5	1,001.1	5.7
Fire hazard reduction:					
Roadside.....	do.....	375.2	730.5	1,105.7	-----
Trailside.....	do.....	240.5	884.8	1,125.3	1
Other.....	Acres.....	40,555.6	42,179.6	82,735.2	11.7
Fire presuppression.....	Man-days.....	31,364	7,353	38,717	-----
Fire prevention.....	do.....	3,881	135	4,016	-----
Tree and plant disease control.....	Acres.....	21,077.5	36,687.8	57,765.3	-----
Tree insect pest control.....	do.....	101,180.6	79,080	180,260.6	11,920
Beach improvement.....	do.....	4.4	263	267.4	1
Fine grading, road slopes, etc.....	Square yards.....	1,459,760	2,044,946	3,504,706	-----
General clean up.....	Acres.....	16,629.6	39,645	56,274.6	3,204
Lake or pond site clearing.....	do.....	64.6	3,675.1	3,739.1	-----
Landscaping, undifferentiated.....	do.....	3,999.2	9,105.3	13,104.5	137
Moving and planting trees and shrubs.....	Number.....	533,287	859,282	1,392,569	231,207
Obliteration:					
Roads.....	Miles.....	6.6	26.3	32.9	-----
Trails.....	do.....	8.7	13.8	22.5	-----
Borrow pits.....	Man-days.....	7,399	27,779	35,178	-----
Parking areas and parking overlooks.....	Square yards.....	13,462	380,522	393,984	-----
Public camp ground development.....	Acres.....	537.1	3,444.7	3,981.8	86
Public picnic ground development.....	do.....	60.1	549.8	609.9	86
Razing undesirable structures.....	Number.....	128	156	284	-----
Seed collection, flowers, grasses, etc.....	Pounds.....	63	152	215	-----

NATIONAL PARKS TABLE 9.—*Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service, July 1, 1934, to June 30, 1935—Continued*

Item	Unit	Total work accomplished from July 1, 1934, to June 30, 1935			
		New construction			Mainte- nance
		National parks and monu- ments	State parks	Combined total national parks and State parks	National parks and monu- ments
Seeding and sodding.....	Acres.....	1, 572. 1	893. 8	2, 465. 9	2, 042
Soil preparation (fertilizing, etc.).....	do.....	473, 955. 5	676. 2	474, 631. 7	-----
Vista or other selective cutting for ef- fect.....	do.....	214. 7	861	1, 075. 7	-----
Walks; concrete, gravel, cinder, etc....	Linear feet.....	4, 349	13, 832	18, 181	450
Fish-rearing ponds.....	Number.....	8	10	18	25
Food and cover planting and seeding.....	Acres.....	-----	194. 5	194. 5	-----
Lake and pond development.....	Man-days.....	596	6, 613	7, 209	-----
Stocking fish.....	Number.....	391, 720	316, 300	708, 020	-----
Stream development.....	Miles.....	42. 6	167. 2	209. 8	-----
Other wildlife development.....	Man-days.....	753	1, 312	2, 065	-----
Education, guide, and contact station work.....	do.....	9, 743	1, 052	10, 795	-----
Emergency work—Searching for or res- cuing persons.....	do.....	30	822	852	-----
Emergency work—Other.....	do.....	1, 743	25, 057	26, 800	-----
Eradication of poisonous weeds or exotic plants.....	Acres.....	1, 818	8, 661. 6	10, 479. 6	-----
Experimental plots.....	Number.....	26	-----	26	5
Insect pest control.....	Acres.....	2, 388	8, 576. 5	10, 964. 5	-----
Maps—Type, topographic, etc.....	Man-days.....	457	1, 544	2, 001	-----
Relief maps and models.....	do.....	-----	630	630	-----
Marking boundaries.....	Miles.....	5	39. 5	44. 5	-----
Mosquito control.....	Acres.....	-----	1, 013	1, 013	-----
Preparation and transportation of materials.....	Man-days.....	10, 997	41, 279	52, 276	-----
Reconnaissance and investigation— Archaeological.....	do.....	7, 268	2, 993	10, 261	-----
Reconnaissance and investigation— Other.....	do.....	408	320	728	-----
Restoration of historic structures.....	Number.....	64	6	70	-----
Rodent control.....	Acres.....	-----	8, 601. 3	8, 601. 3	-----
Surveys:					
Grade lines.....	Miles.....	30, 252. 6	149. 5	30, 402. 1	-----
Ground water.....	Acres.....	4, 735. 4	17. 2	4, 752. 6	-----
Lineal.....	Miles.....	147. 2	2, 670. 3	2, 817. 5	-----
Topographic.....	Acres.....	10, 382. 4	162, 918. 4	173, 300. 8	-----
Type.....	do.....	179, 442	120	179, 562	-----
Other.....	Man-days.....	822	759	1, 581	-----
Tree surgery.....	do.....	19, 081	9, 397	28, 478	104

GEOLOGICAL SURVEY

(WALTER C. MENDENHALL, Director)

During the fiscal year 1934-35, although directly appropriated funds for the support of the Survey's regular activities have been at a low ebb (see details in later pages), these have been augmented by substantial allocations for closely related work made by the Public Works Administration.

As a consequence the year has been a busy and productive one. More than 46,000 square miles of mapping has been done, including a beginning in Puerto Rico; 1,900 linear miles of streams with potential power values have been surveyed; about 700,000 individual maps have been distributed, many of them to cooperating States and new Government agencies; approximately \$40,000 has been received directly from sales of Survey publications; studies of a number of the long-neglected mineral deposits of the Eastern and Southern States have been made; it has been possible to repair and put in good condition approximately 500 of the nearly 3,000 river-measurement stations distributed over the United States; special drought studies have been carried out; Alaskan mapping and mineral-resources investigations have continued at a nearly normal rate; many abandoned wells and mines on public and Indian lands that were actual or potential menaces to safety or to mineral or water supplies were repaired; substantial progress was made in the preparation of numerous unit plans of development of oil and gas fields under the mineral leasing acts—a valuable conservation measure; and supervision, although inadequate, was maintained over nearly 15,000 oil and gas and other mineral properties on public and Indian lands and naval reserves.

Effective cooperative relations have been maintained with a large number of States in geologic work, study of water supplies, and topographic mapping. Similar relations have existed with a number of the older and newer agencies of Government, the special capacities of the technical staffs of the Survey being thus made available in numerous governmental activities, including those of the Petroleum Administrative Board, the National Resources Board, the Bureau of Public Roads, the Tennessee Valley Authority, the Office of Indian Affairs, and many others.

There is an insistent Nation-wide and thoroughly logical demand for greatly increased activity in topographic mapping because of the

now publicly recognized need for maps as bases for so many public and private activities. Urban and rural development, road locations, land, census, and soil problems, crop-control programs, irrigation, park and forest administration—all need these maps acutely. This national need should be met by provision for speeding up the mapping program.

A growing Survey problem, now very inadequately financed, is that of the administration of the mineral leasing laws. The Government's effective management as lessor of its mineral estate is jeopardized by inadequate skilled staff and the resulting inadequate inspection and control of leased properties. This situation needs prompt correction. Losses far in excess of the cost of adequate inspection and management are threatened by insufficient provision for this work.

The mineral industry depends upon and demands many more, and prompter issue, of the scientifically sound and impartial reports of the Geological Survey upon the active and potentially active mining districts of the Nation. Wherever available, these reports are guides in the development of ore bodies and in the search for extensions and for new deposits. More adequate provision is needed for this work and for the publication of results.

Finally, several of the administrative services of the Survey, necessary to its technical activities, have been reduced to the point of near inadequacy as a result of the reductions of recent years in the financial support for the regular services, especially the scientific and technical services of Government. Correction of this situation is one of the present acute needs.

Dr. David White, a member of the staff of the Geological Survey since 1886 and its chief geologist from 1912 to 1922, died February 7, 1935, at the age of 73. In his death geologic science lost one who had been a recognized leader on this continent for more than a generation. Though he was primarily a paleobotanist and the American authority in this field, his activities embraced many branches of geology as well as administration. Dr. White's career is a striking example of the type of leadership at the service of the American people in the scientific establishments at Washington. Recognized and honored the world over as a scientist of the highest standing, whose research and administrative work had direct practical applications of great value; repeatedly offered by commercial organizations salaries several times greater than the Government paid him—he nevertheless remained in the service throughout his career and devoted his rare abilities and his limitless industry to the Government and the people of the United States.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—Field parties of the geologic branch were actively at work in the beginning of the fiscal year on mineral-resources and land-classification surveys in 19 States east of the Rocky Mountains for which funds had been allocated by the Public Works Administration. One of the more important projects thus carried on was a report on the mineral resources of the region tributary to Boulder Dam, prepared as an aid in the study of possible markets for Boulder Dam power. Other projects included studies of the quicksilver deposits in Texas and Arkansas, the gold deposits of the southern Appalachian region, the clays of several Southern States, and the iron ores of northeastern Texas. Work was continued throughout the year on the metal-mining districts of Colorado, Idaho, and New Mexico in cooperation with the States, and some assistance was given to the Arizona Bureau of Mines in a survey of the Tombstone district. A resurvey of the Comstock lode in Nevada was begun near the end of the year. Stratigraphic and structural surveys of the San Andreas rift and Death Valley, Calif., were resumed, and field projects were carried on in Illinois and Kentucky, in the Coastal Plain area of Louisiana, Mississippi, and North Carolina, in eastern Pennsylvania, and in the Wasatch Plateau, Utah. Temperatures in deep wells were measured in several oil fields. Areas of forest lands, mostly in the Appalachian region, were geologically examined for the Forest Service. A comprehensive review of the geology and occurrence of petroleum in the United States was prepared for a subcommittee of the House Committee on Interstate and Foreign Commerce.

Explorations in Alaska.—In the field season of 1934, 7 field projects were carried on in Alaska, 2 of which were primarily topographic and 5 primarily geologic. This work was financed in part by grants from the Public Works Administration. The usual general survey of recent mining developments and the collection of mineral statistics were continued. Six field projects for the season of 1935 had been started at the end of the fiscal year and will be continued throughout the open season. Compilation of base maps from aerial photographs taken in 1926 and 1929 by the Navy Department was continued throughout the year, the work being done in Juneau, Alaska, with an enlarged staff.

Topographic mapping.—A notable increase was made in the area covered by new topographic surveys, resurveys, and revision, the total being 30,924 square miles representing over 200 topographic maps with contours. The topographic mapping included all States. There was also a considerable increase in the area covered by planimetric maps without contours resulting from aerial photography, which covered 15,721 square miles in 9 States. In addition, aerial photographs were used as bases for topographic mapping in 42 quadrangles. Successful experiments were undertaken with single-lens aerial photographs with a wide-angle lens at high altitudes. The sectional transportation map of the United States being made for the Bureau of Public Roads was continued with increased output. The map of Iowa, the first State issued, consists of eight sections. These transportation maps on a scale of about 4 miles to 1 inch show all kinds of transportation routes in a variety of colors.

Investigations of water resources.—The water-resources branch collected and made available for publication stream-flow records at more than 3,000 river-measurement stations on rivers large and small, obtaining thus authentic information on the behavior of streams in drought, in flood, and in normal conditions—information which is invaluable for intelligent planning of projects

for use or control of the water supply. This work included the construction of many new stations on the larger rivers of the country and the complete rehabilitation of more than 500 existing stations. It investigated underground water supplies in 32 States and in the Territory of Hawaii and obtained basic information on the occurrence, quantity, and quality of underground water supplies which is essential for the development, conservation, and use of ground water upon which a large part of the population of the country must depend. In collaboration with the Mississippi Valley Committee of the Public Works Administration the branch made a comprehensive study of floods in the United States with reference to magnitude and frequency and an investigation of the relation of rainfall and run-off in the United States. A report on the flood study was sent to the printer near the end of the year, and a report on the rainfall and run-off study was nearly completed. A broad study was made of the great droughts of 1930-34, with an extensive compilation of information about the drought and a comparison with notable droughts of earlier years. An investigation had been made of the stream flow and silt movement of streams in eight projects of the Soil Conservation Service, and similar studies on the Colorado River. The completion of a program of well drilling at Salt Lake City, Utah, based upon the recommendations of the Geological Survey, provided a large additional supply of water for the city and averted a serious shortage. A report on the geology and ground-water resources of the Island of Oahu disclosed large supplies of underground water that are available to the city of Honolulu. Investigations conducted in the hydrologic laboratory demonstrated the law of flow of ground water for pressure gradients as low as 1 inch to the mile, which is of practical importance because natural gradients are very low.

Classifying and leasing public land.—The conservation branch made 11,434 formal findings of technical fact involving the mineral resources, water power or storage possibilities, and agricultural or grazing utility of public lands; classified 885,535 acres of withdrawn land as to coal and 267,684 acres of withdrawn land as to oil shale; added 72,793 acres to outstanding water-power reserves and eliminated 408,157 acres therefrom; added 12,480 acres to public water reserves and eliminated 460 acres therefrom; designated 35,450 acres as enterable under the stock-raising homestead law and canceled prior designations of 16,945,535 acres thereunder; designated 1,894 acres as enterable under the Enlarged Homestead Act and canceled prior designations of 25,947,994 acres thereunder; defined the "known geologic structure" of three producing oil and gas fields; completed 1,900 miles of stream-utilization surveys in public-land States; supervised operations or activities under 152 power projects licensed by the Federal Power Commission; supervised on public land 8,394 oil and gas holdings involving 3,699 productive wells, 758 coal properties, 204 potash properties, 45 sodium properties, 26 sulphur properties, 8 phosphate properties, and 1 oil-shale property; on naval petroleum reserves 24 leaseholds involving 529 productive oil and gas wells; and on Indian lands 4,812 leaseholds involving 4,477 oil and gas wells, 36 lead and zinc properties, 39 coal properties, 1 asphalt property, and 1 lime phosphate property; assisted hundreds of oil and gas permittees and operators in the preparation of unit plans of development; participated extensively in the organization and preliminary work of the departmental Division of Grazing; and initiated and fostered legislation looking to material change in the oil and gas provisions of the Federal mineral-leasing law.

Publications.—The publications of the year comprised 35 pamphlets in the regular series, covering a total of 3,509 pages; 86 new or revised topographic

and other maps; and 139 reprinted topographic and other maps. Among the notable book publications were professional papers on the Breckenridge mining district, Colorado, and copper deposits of the Ducktown type in the Appalachian States; bulletins on the quicksilver deposits of southwestern Oregon, the Book Cliffs coal field in Colorado, the geology of Big Horn County and the Crow Reservation, Mont., and the coal in a part of the San Juan Basin, N. Mex.; a paper on the industrial utility of public water supplies in the United States; and a review of the petroleum industry in the United States, 1934. Besides these publications, 36 brief papers, some of them containing simple maps, were issued in mimeographed form as memoranda for the press.

The engraving division printed more than 581,000 copies of maps and folios and, in addition, did repay work amounting to about \$190,000 for over 60 other Government units and State Governments.

NOTE.—Detailed tabular statements are given at the end of the report.

GEOLOGIC BRANCH

SUMMARY

Field parties of the geologic branch were actively at work in the beginning of the fiscal year on mineral-resources and land-classification surveys in 19 States east of the Rocky Mountains for which funds had been allocated by the Public Works Administration. Summary reports giving the results of work on most of these projects have been prepared, and several of them have already been published. Among the more important of these is a report on the mineral resources of the region tributary to Boulder Dam, prepared as an aid in the study of possible markets for Boulder Dam power. Public Works funds were made available through the Bureau of Reclamation, and the preliminary report was published by that Bureau.

Other valuable results made possible through Public Works aid include studies of the quicksilver deposits of the Terlingua district of southern Texas, the recently discovered quicksilver area of southern Arkansas, the gold deposits of the southern Appalachian region, the clays of several of the Southern States, and the iron ores of northeastern Texas.

Work was continued throughout the year on the metal-mining districts of Colorado, Idaho, and New Mexico in cooperation with the States, and some assistance was given to the Arizona Bureau of Mines in a survey of the Tombstone district. A resurvey of the Comstock lode, in Nevada, was begun near the end of the year.

Stratigraphic and structural surveys of the San Andreas rift and Death Valley, Calif., were resumed, and minor field projects were carried on in Illinois and Kentucky, in the Coastal Plain area of Louisiana, Mississippi, and North Carolina, in eastern Pennsylvania, and in the Wasatch Plateau, Utah. Temperatures in deep wells

were measured in several oil fields, and certain areas of forest lands, mostly in the Appalachian region, were geologically examined for the Forest Service.

A comprehensive review and summary of the geology and occurrence of petroleum in the United States was prepared during the year by members of the Survey staff for a subcommittee of the House Committee on Interstate and Foreign Commerce, acting under the chairmanship of Representative William P. Cole, Jr., of Maryland. This summary and review, covering more than 200 pages, with 130 illustrations, chiefly maps, constitutes the greater part of part 2 of the hearings held under House Resolution 441, Seventy-third Congress. The situation in each of the petroleum-producing States is summarized in this volume, and an estimate of the reserves in the known fields is assembled. Important among the papers included are those on the early history of the use and development of petroleum and on its origin. They were written by Dr. David White, principal geologist of the Survey and world authority in this field.

WORK OF THE YEAR, BY STATES

Alabama.—Funds from the Public Works Administration were available through Federal projects 157, 158, and 161 for the continuation in 1935 of several projects on the mineral resources of Alabama begun in the fiscal year 1934, and further funds were made available through Federal projects 183 and 189. The work was done under the supervision of Survey geologists and consisted of the mapping and examination of mines in the Woodstock iron-ore area; geologic mapping and prospecting in the Russellville brown iron ore district; further studies of some of the gold areas of the State, with detailed mapping in some of the most representative and accessible gold-mining districts; investigation of bleaching and other high-grade clays in Clarke and Choctaw Counties as a continuation of studies in Mississippi, in the Cretaceous and Tertiary areas, and in northwestern Alabama; and investigations of manganese iron ore in Cleburne and Cherokee Counties and adjoining portions of Georgia. A paper on the geology of the Hog Mountain gold district was published by the American Institute of Mining and Metallurgical Engineers. A report on tin deposits of Alabama was issued as a press memorandum. A preliminary report on the gold deposits of the State has been prepared for publication by the Alabama Geological Survey. Reports on the clay investigations are nearing completion and will be issued by the Geological Survey.

Arizona.—Progress was made on reports on the geology and ore deposits of the Ajo copper district, the geology of the Tucson quadrangle, and manganese deposits near Artillery Peak. A paper on strontium deposits of southeastern California and western Arizona was published by the American Institute of Mining and Metallurgical Engineers. A geologic survey of the Tombstone mining district is being made in cooperation with the Arizona Bureau of Mines. Work near Boulder Dam is mentioned under California.

Arkansas.—The field studies of the coal and gas resources of the western portion of the Arkansas coal field of Sebastian, Franklin, Crawford, Logan, and Scott Counties (Federal project 163) were completed, and a report on the geology and mineral resources of the area was prepared for publication as a

Survey bulletin. A map showing geologic structure, gas fields, and coal outcrops of the same area will be issued as a preliminary report. Geologic mapping of the quicksilver district of Pike, Clark, and adjoining counties, as a part of Federal projects 163 and 184, was completed. Publications resulting from this investigation are "Mine developments in the Arkansas quicksilver district to June 1, 1934," and "Investigation of the Arkansas quicksilver district by the United States Geological Survey", which were transmitted to the Arkansas Geological Survey; "Quicksilver deposits near Little Missouri River, southwest Arkansas", published by the American Institute of Mining and Metallurgical Engineers; "Quicksilver deposits near Little Missouri River and near Antoine Creek", issued as a press memorandum. Exploratory drilling and geologic mapping in Saline, Pulaski, and Garland Counties were done to determine the extent of bauxite deposits (Federal projects 163 and 185).

Papers on the fossil flora of the Wedington sandstone member of the Fayetteville shale and the carbon ratio in a part of the Arkansas-Oklahoma coal field were transmitted to the American Association of Petroleum Geologists for publication, and a report on cyclical sedimentation and the stratigraphy of the Bloyd shale, Morrow group, near Fayetteville, was submitted to the Journal of the Washington Academy of Sciences.

California.—Reports on the Kettleman Hills oil and gas field, the geology and mineral resources of the San Pedro Hills, the geomorphology of the San Joaquin Basin, the Grass Valley mining district, chrome in northern California, and the origin of the borate deposits of Kramer were in preparation during the year. Geologic investigations in the southern part of the Death Valley region and of the San Andreas rift and Cajon Pass region were continued. Grants from the Geological Society of America financed a study of the calcium carbonate content of fine-grained clastic sediments in California, a survey of the Nevada City mining district, and a study of Miocene diatomaceous deposits. A paper on the relation of salinity to the calcium carbonate content of marine sediments will be published by the Geological Survey, and one on the organic content of sediments from several American oil-producing areas has been issued by the American Petroleum Institute.

A preliminary report on mineral resources in the region tributary to Boulder Dam, the work for which was done by geologists of the Survey by funds allotted by the Public Works Administration to the Bureau of Reclamation, was published by that Bureau in November 1934; a more complete report has been prepared for publication as a Survey bulletin. Under a Public Works allotment (Federal project 153), the drafting of the geologic map of California was continued in cooperation with the State. Routine seismologic and meteorologic observations were continued at the volcanologic station at Mineral, though the volcanologist in charge was furloughed part of the time on account of reduction of funds. On June 30, 1935, this station was closed, and the building, which is in a national forest, was transferred to the Forest Service.

Colorado.—Cooperation was continued with the Geological Survey Board of Colorado and the Colorado Metal Mining Fund in investigations of the mining regions of the State. Further field studies were made in the Ouray and Red Mountain districts of the San Juan region, the Nederland tungsten district, the Alma district, and the Gold Hill and Ward mining districts of the Front Range, and a study of the geology and mineral resources of the La Plata Mountain region of southwestern Colorado, with special reference to mining geology, was begun. Reports are in preparation on the ore deposits of the Front Range, the Snowmass area, the Jamestown, Alma, and Ouray districts, the Nederland tungsten district, and the Paleozoic stratigraphy. A paper

on the Cripple Creek district was published by the Colorado Scientific Society, and one on the Tincup mining district, in Gunnison County, will be published by the same society. Preliminary papers resulting from these investigations on geology and ore deposits of the Cripple Creek district, ore deposits of the Mosquito and Sawatch Ranges, geologic guidance to the development of the San Juan ore deposits, and the ore deposits of Clear Creek, Gilpin, and Boulder Counties were offered for publication in the Colorado number of the Engineering and Mining Journal. A paper on reconnaissance observations of the Upper Cretaceous rocks north of the Arkansas River in eastern Colorado was submitted to the American Association of Petroleum Geologists.

Florida.—Prospecting for phosphate on reserved public lands in Polk, Marion, and Citrus Counties for the purpose of classifying the land was continued by a party under the supervision of a Survey geologist, financed through Federal projects 164 and 188. Field work in connection with the project was completed at the end of the fiscal year. Explorations for bleaching and other high-grade clays (as a part of Federal project 164) were made in Jackson, Alachua, Gadsden, Jefferson, Marion, Holmes, Leon, Madison, and Washington Counties. A preliminary report on the clay studies will be issued by the Geological Survey as a press memorandum. A paper on the Tampa limestone is in preparation, and one on the Choctawhatchee gastropods and scaphopods from the Alaquá Creek Valley, a cooperative project, was transmitted to the Florida Geological Survey.

Georgia.—Detailed mapping of various operating mines in the Dahlonega and other gold-bearing areas in Georgia, begun during the fiscal year 1934 under allotment of funds from Public Works Administration (Federal projects 158 and 165), was completed, and five short articles on gold deposits of Georgia were published in the monthly bulletin of the State Department of Forestry and Geological Development and later combined and issued by the Division of Geology as Information Circular 4. By additional funds (Federal project 183) a study of gold districts in Cherokee, Dawson, Lumpkin, and White Counties was made. A short paper on the Battle Branch mine, near Auraria, will probably be published in Economic Geology. As a part of Federal project 165 a study was made of the kyanite and vermiculite deposits of northern Georgia, and a report of the investigation was transmitted to the State geologist for publication. Explorations for bleaching clays were conducted in various parts of the State (Federal projects 165 and 189), and reports have been prepared for publication by the State and the United States Geological Survey. Manganese ore deposits at Cartersville and near Toccoa, Iron City, and Union Point were examined, the results to be incorporated in a paper on manganese deposits of the crystalline belt from Georgia to Maine. At the request of the Forest Service, lands were examined and reports made on proposed additions to the Broad River National Forest.

Hawaii.—Because of greatly reduced funds the work of the section of volcanology, with headquarters at Hawaii National Park, was curtailed, and the two employees were furloughed for half a year each. With the cooperation of the Volcano Research Association the routine of the observatory was maintained, the Volcano Letter issued, and seismologic studies of Kilauea continued.

Idaho.—Cooperation with the Idaho Bureau of Mines was continued in the Boise Basin, Thunder Mountain, Edwardsburg, and Yellow Pine districts and in a study of the gold-bearing gravel in the vicinity of Grangeville, along the Salmon River, and in the Florence district. Reports were also in preparation on the general geology of south-central Idaho and on the Idaho mining dis-

riets. A press memorandum on the Elk City mining district was issued, and a bulletin on the geology and ore deposits of the Bayhorse quadrangle was completed for Survey publication. Papers resulting from cooperative work published by the Idaho Bureau of Mines include a preliminary report on the geology and ore deposits in the eastern part of the Yellow Pine district (Pamphlet 43) and a report on the Pearl-Horseshoe Bend gold belt (Pamphlet 41). A report on the geology and mineral resources of the Ammon and Paradise Valley quadrangles was in preparation.

Illinois.—The fluorspar deposits of the Cave-in-Rock and Rosiclare districts, southeastern Illinois, were investigated by geologic mapping and geophysical studies, and a preliminary paper dealing with the geology of southern Illinois and the fluorspar deposits was transmitted to the Illinois Geological Survey. This work was done under Federal project 166 and was continued until the funds allotted were exhausted. Further studies in the region were resumed near the end of the fiscal year in cooperation with the Illinois Geological Survey. Work was continued on the monograph of the Pottsville flora of the Eastern Interior Basin, mainly in Illinois but including adjoining portions of Indiana, western Kentucky, and southeastern Iowa, which is being prepared in cooperation with the Illinois Geological Survey.

Kansas.—Field examinations of the stratigraphy, structure, and coal resources of southeastern Kansas in Cherokee County and parts of Labette and Crawford Counties, under Federal project 167, were completed, and a report on the geology and mineral resources of the southeastern Kansas coal field was prepared for publication as a Survey bulletin. A contour map with text, of the base of the Cherokee shale in the zinc-lead district of southeastern Kansas will be issued by the Geological Survey as a press memorandum, and a map showing structure of the southeastern coal fields of the Kansas zinc-lead districts will be published by the Kansas Geological Survey. Stratigraphic mapping and studies of lead and zinc mines were made in the Kansas part of the Tri-State lead and zinc area.

Kentucky.—A report on the coal deposits of Pike County, giving the results of investigations in 1934 and the early part of 1935 by a party under the supervision of a Survey geologist working under Federal project 168, was completed for publication as a Survey bulletin. The studies of the fluorspar area in Kentucky under Federal project 168 consisted of geologic and geophysical mapping in the vicinity of Marion. Papers on the New Providence shale in the vicinity of Junction City and on a new crinoid genus from the Mississippian of Ohio and Kentucky are in preparation. A report was made to the Forest Service on proposed additions to the Cumberland Purchase unit in the southeastern part of the State. Work on the Pottsville flora is mentioned under Illinois.

Maryland.—Studies of the structural materials of Maryland, chiefly sand and gravel, continued by Public Works funds (Federal project 169), covered areas in Prince Georges, Montgomery, Anne Arundel, Charles, Howard, Cecil, Harford, and Baltimore Counties.

Mississippi.—A report giving the results of an investigation of the bleaching clays of Mississippi made in 1934 from Public Works funds (Federal project 171) has been prepared.

Missouri.—In connection with the investigation of the Tri-State lead and zinc district (Federal project 172) stratigraphic sections were studied in the lead and zinc areas of Jasper and Newton Counties, and detailed mapping of mines was done in the Waco and Joplin areas. Reports on these districts were prepared for the Missouri Geological Survey.

Montana.—Work was done on papers on the physiography and glacial geology of western Montana, the glacial geology and physiography of Glacier National Park, the geology and ore deposits of the Libby quadrangle, the geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties, and fossil plants from the Fort Union and associated formations. Reports on the coal resources of McCone County and on phosphate near Maxville were completed for Survey publication.

Nevada.—Further field studies were made in the Tonopah and Hawthorne quadrangles, partly through a grant from the Geological Society of America, and a study of recent faults in the western part of the Great Basin was made through a grant from the same society. A resurvey of the Comstock lode was begun in June 1935. A detailed report on the geology and mineral resources of the Tonopah and Hawthorne quadrangles and reports on the Tonopah, Tuscarora, Gold Range, Searchlight, and Delamar mining districts were in progress. A set of mine maps of the Tonopah district was placed in open files in the San Francisco, Salt Lake City, Reno, and Washington offices of the Geological Survey. A report on the underground geology of the Tonopah mining district will be published by the Nevada Bureau of Mines; and a paper on a pregranodiorite dike in granodiorite, Paradise Range, by the American Geophysical Union. Work near Boulder Dam is mentioned under California.

New Mexico.—Cooperation with the New Mexico Bureau of Mines was continued in an investigation of the Eureka and Sylvanite mining districts and geologic mapping of the Little Hatchet Range, in Hidalgo and Grant Counties. A report on the Bayard area of the Central district was completed for Survey publication, and one on the Virginia mining district was sent to the New Mexico Bureau of Mines for publication. Both these reports were products of cooperative investigations. Office work was continued on the manuscript on the geology and ore deposits of the Magdalena mining district. A paper on igneous assimilation and associated metamorphism in the Virginia mining district was transmitted to the American Mineralogist, and one on hydrothermal leaching in the Virginia mining district to Economic Geology. A report on the structure and igneous geology of the Mount Taylor volcanic field was completed for Survey publication. A paper on logs of the Government core tests for potash in New Mexico and Texas was sent to the Texas Bureau of Economic Geology, and one on the Permian formations of the Pecos Valley of New Mexico and Texas was submitted to the American Association of Petroleum Geologists.

New York.—Field studies of the stratigraphy, structure, and gas resources of south-central New York, including portions of Seneca, Livingston, Ontario, Schuyler, Chemung, Steuben, Yates, Allegany, and Cattaraugus Counties, were continued under Federal projects 173 and 187. A preliminary report on the structure and gas possibilities of the Watkins quadrangle will be issued as a press memorandum. A study of the talc deposit of St. Lawrence County was made as a part of Federal project 173.

North Carolina.—Investigations of gold-bearing regions in the slate and granite areas of the western part of North Carolina, extending from the South Carolina border to Guilford County, were completed under funds from the Public Works Administration (Federal project 174). A preliminary report covering these investigations was issued as a press memorandum. Additional funds were received through Federal project 183 for the completion of detailed examinations of mines and prospects and mapping the geology of the gold-bearing regions of the State. Detailed work was done in Union and Stanly

Counties. Reports on the Uharie and Sauratown purchase units were made for the Forest Service.

North Dakota.—The mapping of the coal resources of the Minot district, in McHenry, Ward, McLean, Mercer, and Sheridan Counties, under a Public Works Works allotment (Federal project 159), was completed, and a preliminary map of the area was issued. A detailed report on the geology and coal resources of the area will be published later as a Survey bulletin.

Oklahoma.—With Public Works funds field mapping was continued on the coal and gas resources in Pittsburg, Haskell, and Latimer Counties (Federal project 175) and a survey of wells in the Quinton gas pool was made (Federal project 186). A report on the Quinton-Scipio district, covering the gas field of Pittsburg County, has been completed, and a preliminary map of the geology and structure of the area has been prepared for publication. Federal project 160 provided for a study of the Lehigh district, in Coal and Atoka Counties, field work on which was completed. This area has also been covered by a report intended for publication as a Survey bulletin, and a geologic map of the region has been prepared for advance publication. Under Federal project 63-M the mapping of the Osage and adjoining Indian lands, with special attention to the subsurface structure, was continued, and a report on the subsurface geology of Osage County was prepared. The Tri-State lead and zinc project, in Kansas, Missouri, and Oklahoma, provided for by Public Works funds (Federal projects 167, 172, and 175) begun in 1934, was continued during the entire year. The work in Oklahoma included stratigraphic and areal mapping, with detailed study of the principal mines in the Picher and Miami districts, northeastern Oklahoma. Geologic studies were continued in the Ouachita Mountains, and reports are in preparation on the Moorefield fauna, the fauna of the Sycamore limestone, and the geology and mineral resources of the Howe-Wilburton district. Work on the origin and environment of source sediments is mentioned under California.

Oregon.—Preparation of a report on the metalliferous deposits of the Cascade Range was continued, and a paper was prepared on Miocene plants from Idaho, Oregon, and Washington for publication in the *Journal of Paleontology*.

Pennsylvania.—Some additional field data were collected in the Hanover and York quadrangles in connection with a report on the geology of these quadrangles prepared in cooperation with the Pennsylvania Geological Survey. A brief paper on Appalachian structure in the York-Hanover area will be published by the Geological Society of America. A manuscript describing the Paleozoic and Quaternary sedimentary rocks and the geologic structure of the New Cumberland quadrangle was transmitted to the Pennsylvania Geological Survey for inclusion in a State bulletin. A field study of the structure of the Reading-Boyetown Hills area was made, and a paper was prepared on "The highlands near Reading, Pa., an erosion remnant of a great overthrust sheet", for publication by the Geological Society of America. Revision of the geologic report on the Honeybrook and Phoenixville quadrangles was under way, and the study of the progressive regional metamorphism of the Lower Kittanning coal bed of western Pennsylvania was continued.

South Carolina.—The survey of the geology and gold deposits of South Carolina, begun in 1934 with Public Works funds (Federal Projects 158 and 176), covered areas in Lancaster, Chesterfield, York, Union, and McCormick Counties, and later funds through Federal Project 183 were devoted to detailed mapping in the Haile and Brewer mine areas, in Chesterfield and Lancaster Counties. The results of the earlier examination have been given in a press memorandum entitled "Preliminary report on gold deposits in North Carolina

and South Carolina." Public Works funds (Federal projects 176 and 189) provided for a preliminary survey of bleaching-clay deposits of South Carolina, on which a report has been completed. A report on the geologic aspects of the Santee-Cooper hydroelectric project was prepared for the Public Works Administration. Examinations of manganese near McCormick and from Columbia to Gaffney were made in connection with the general study of manganese of the crystalline rocks of the Piedmont area. Areas in the Long Cane and Enoree purchase units were examined and a report made to the Forest Service.

Tennessee.—A report on clay deposits of Tennessee, as a result of recent field studies made with Public Works funds (Federal project 177), was completed, and a report on zinc, lead, and barite materials is in preparation.

Texas.—The Public Works Administration financed several studies of the mineral resources of Texas (Federal project 178). Surveys of the Shafter silver district and the Terlingua quicksilver district were completed, and preliminary reports on both districts were sent to the Texas Bureau of Economic Geology. More detailed reports on these areas will be published by the United States Geological Survey. A study of the iron ores of northeastern Texas, lying largely in Cass, Marion, and Morris Counties, was completed and a progress report on the investigation was issued by the Texas Bureau of Economic Geology; a final report is in preparation for publication by the Survey. A study of the stratigraphy and structure, with special attention to oil, gas, and coal, in parts of north-central Texas, including areas in Young, Stevens, Throckmorton, Coleman, and Brown Counties, has been completed, and a report will be transmitted to the Texas Bureau of Economic Geology. A report on the clay resources of the San Antonio area was prepared.

The geology of the Guadalupe Peak quadrangle and the Cambro-Ordovician of the Central Mineral Region were studied through grants from the Geological Society of America. A report on the geology of the Monument and Marathon quadrangles was submitted for Survey publication. Papers on potash in Texas and an unconformity in the late Paleozoic of trans-Pecos Texas were sent to the State Bureau of Economic Geology. Further studies were in progress on the fossils of the Navarro formation of Texas (in cooperation with the Texas Bureau), the geology of the Guadalupe Mountains, and the Eocene faunas of the Gulf region. A paper on upper Mississippian rocks of trans-Pecos Texas was sent to American Association of Petroleum Geologists for publication. Work on source rocks of petroleum is mentioned under California.

Utah.—Office work was continued on reports on the geology and structure of southeastern Utah; the geology of the area between Green and Colorado Rivers in Grand and San Juan Counties; the structure, stratigraphy, and coal resources of the western part of the Wasatch Plateau; and stratigraphic relations of the Wasatch formation in central Utah. A manuscript on the San Juan country, a geographic and geologic reconnaissance of southeastern Utah, was submitted for publication as a professional paper.

Vermont.—A report on the addition to the Green Mountain National Forest was made for the Forest Service.

Virginia.—Studies of the lead, zinc, gold, and other minerals of Smyth, Wythe, and Carroll Counties, southwestern Virginia, made through Public Works Administration funds, beginning in 1934, were continued. Preliminary reports on these investigations published by the Virginia Geological Survey include papers on the zinc belt, the copper and iron deposits, and the gold deposits. Examinations of the gold regions of the Piedmont area (Federal

projects 158 and 183) will be covered by a paper also to be published by the Virginia Geological Survey. Manganese deposits were examined near Lynchburg and Galax. Examinations were made of the Clinch River purchase area and of the Mountain Lake forest-reserve tract for the Forest Service. A paper on the titanium deposits of the State is in preparation.

Washington.—Fossil plants were collected from the Latah formation in the vicinity of Spokane, and a paper entitled "Leaves and fruits from Miocene strata in Idaho, Oregon, and Washington", was submitted for publication in the *Journal of Paleontology*.

West Virginia.—The results of investigation of the manganese deposits of eastern West Virginia (Federal project 169) have been included in a report submitted to the West Virginia Geological and Economic Survey.

Wyoming.—A detailed report with geologic map on the mineral resources and structure of the Afton quadrangle is in preparation, and a paper on anticlines between the Hiaawatha gas field and Baggs was sent to the American Association of Petroleum Geologists.

WORK IN CHEMISTRY AND PHYSICS

The chemical work consists largely of routine analyses and tests of ores, rocks, and minerals collected on account of their bearing on geologic problems, such as the mapping and valuation of mineral deposits and the origin and method of deposition of ores. Many tests are also made of mineral specimens submitted by correspondents of the Survey. Individual minerals are analyzed and technically described, the age of minerals and rocks is determined by special chemical analyses, and new methods of analysis are devised and tested for the purpose of obtaining more accurate results.

Among materials analyzed in the laboratory during the year were a geode of hematite containing gas, liquid, and solid inclusions; samarskite from Connecticut, which checked in age with two other minerals previously analyzed from the same locality; jarosite from Texas; chromite from California; alunite from Utah; pollucite from South Dakota; pyroxene from Virginia; cerite from Colorado; rutile from Virginia; over 56 igneous rocks, a great variety of clays, ores, sediments, and several new minerals. A new deposit of natural alkali in Ward County, Tex., identified and described in the Survey laboratory, was put into production during the year. The production of natural alkali has steadily increased during recent years.

During the year 4,236 examinations or tests of minerals and rock samples were made. These included 926 specimens tested or identified for persons not officially connected with the Survey. There were 1,682 chemical analyses made for geologists or in aid of general geologic projects, and 685 similar analyses were made in connection with studies of methods of analysis and geochemical investigations relating to the formation and alteration of minerals under natural conditions. The remaining 943 tests related to potash cores, well cuttings, and similar samples.

Among the more important items of work in physics were the testing of more than 1,500 samples of clay with reference to their effectiveness in bleaching oil and the best methods of treating them for that purpose; and the observations of temperature in deep wells in Pennsylvania, West Virginia, Alabama, Mississippi, Louisiana, Utah, and California. Several classes of geologic data were subjected to mathematical discussion.

ALASKAN BRANCH

The Geological Survey's work in Alaska is concerned primarily with the investigation of the mineral resources of the Territory and comprises field examination of the various factors that pertain to the character, distribution, and development of these resources, and laboratory and office studies by which these field observations are analyzed and the results made available to the public through reports, maps, and other media. In addition to the funds regularly appropriated by Congress for this work, funds from the Public Works Administration were granted to supplement those for a general project (Federal project 162) and to enable the Geological Survey to carry on special mapping work (Federal project 69). Cooperation was also continued with the Alaska Railroad, the expense of which was borne mainly by the railroad. The work of the branch, in addition to serving the prime purpose of assisting the mining industry, is utilized extensively by Government organizations having to do with other special fields of investigation within the Territory, such as the Forest Service, the Alaska Road Commission, and the Biological Survey. The Geological Survey's maps of Alaska are indispensable in any enterprises concerned with the development of the Territory.

Manuscripts and publications.—During the year 4 reports and 2 maps have been published. In addition, 11 manuscript reports (including maps) and 4 separate manuscript maps have been completed by their authors and are in various stages of critical review, proof, or preparation for publication. A reprint of one map previously published is in press. At the end of the year 8 manuscript reports and 4 manuscript maps were partly completed.

Work of the year.—In addition to the routine duties, 9 principal projects, 7 of which involved new field work, were carried on during the season of 1934. The field projects included 5 that were principally geologic and 2 that were primarily topographic. The projects involving new geologic field work were located in the area adjacent to Ketchikan, southeastern Alaska; in part of the Alaska Range, including the headwater region of the Copper River Valley and parts of the Tanana Valley; in the Kaiyuh Mountains, which lie south and east of the Yukon River in the region west of Ruby and southeast of Kaltag; in the northern and eastern part of Kodiak Island, southwestern Alaska; and in the coal fields adjacent to Eska, in the Matanuska district of the Cook Inlet-Susitna region. The Eska work was financed by and carried on at the request of the Alaska Railroad and mainly in its interest. The topographic projects include the mapping of an extensive tract of Admiralty Island and

adjacent parts of the Juneau district, in southeastern Alaska, and mapping of parts of the Alaska Range at the head of the Copper River, especially in the vicinity of Mentasta Pass and Suslota Lake. The two projects not directly involving new field work were the continuation of the compilation of drainage maps of southeastern Alaska from the airplane photographs taken by the Navy Department and the annual canvass of mineral production.

In order to utilize effectively the all too short open season, the Geological Survey field parties begin work in the spring as early as climate and other conditions permit. The field projects for the season of 1935 were begun a month or more before the end of the fiscal year, but as most of the field parties were out of touch by ordinary means of communication, it is not practicable to give here more than a summary of the work that it is expected will be accomplished.

Six field projects have been authorized for the season of 1935, and their completion, with the essential office work, will occupy all the time until well into the spring of 1936. These projects include 4 geologic investigations and 2 topographic mapping projects, in addition to the usual canvass of mineral production, further compilation of planimetric base maps, and other miscellaneous general work.

The four geologic projects include studies of that part of the Alaska Range region east of the Richardson Highway and north of Slana; of the central and southern part of Kodiak Island; of the Tikchik Lake district of southwestern Alaska; and a general study of the permanently frozen ground as affecting mining development in central and western Alaska, especially in the Fairbanks and Nome districts.

The two topographic field projects include the continuation of surveying and mapping in the Admiralty Island area of southeastern Alaska west of Juneau and in the Alaska Range region, especially in the Tok Valley and adjacent parts of the Tanana region south of Tanana Crossing.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 46.7 percent mapped, the year's increment amounting to 0.7 percent. The area covered by topographic base maps without contours and prepared from aerial photographs after field examinations continued large.

FIELD SURVEYS

Abbreviations for projects used below: Federal Emergency Administration of Public Works, "P. W."; Tennessee Valley Authority, "T. V. A."; Federal Emergency Relief Administration, State projects, "F. E. R. A." Cooperation with States was continued on a smaller scale than in recent years.

Alabama.—Palos and Basham 15' quadrangles (P. W.) completed, and Mount Hope 15' quadrangle (P. W.) continued. Mapping without contours from aerial photographs begun for 7½' quadrangles within Iuka 15' quadrangle (T. V. A.).

Arizona.—Payson No. 1, Payson No. 2, and Castle Dome Peak No. 3 15' quadrangles (P. W.) completed; Grand Encampment National Monument (P. W.) continued; Payson No. 3 15' quadrangle (P. W.) begun.

Arkansas.—In cooperation with the United States Army district engineer at Vicksburg, Felsenthal, Moro Bay, Stuttgart, and S½ Ingalls 15' quadrangles completed. Watalula and Alexander 15' quadrangles (P. W.) and Scott No. 2, Cabot No. 3, and Alexander No. 1 7½' quadrangles (P. W.) completed; Caddo Gap No. 1 and Caddo Gap No. 2 15' quadrangles (P. W.) and North Little Rock No. 4 7½' quadrangle (P. W.) begun.

California.—In cooperation with the county surveyor of Los Angeles County, Acton, Mount Wilson, Chileno Canyon, Camp Rincon, Camp Bonita, Pallett Creek, Boneyard Canyon, Mescal Creek, and Valyermo 6' quadrangles completed; Mount Emma, Alder Creek, Trail Canyon, and Mount Gleason 6' quadrangles begun. Paynes Creek 30' quadrangle (P. W.) continued; Burney 30' quadrangle (P. W.) begun.

Colorado.—Como No. 2 and Taylor Park 15' quadrangles (P. W.), Grand Encampment 30' quadrangle (P. W.), Colorado National Monument and Black Canyon National Monument (P. W.) completed; Castle Rock Nos. 1 and 2, Castle Rock Nos. 3 and 4, East Denver Nos. 3 and 4, Leadville No. 1, and Leadville No. 4 15' quadrangles (P. W.) begun.

Connecticut.—7½' New London and Niantic 7½' quadrangles (P. W.) completed; New London No. 2 7½' quadrangle (P. W.) begun.

Delaware.—Wilmington special map (P. W.) begun.

Florida.—De Funiak Springs, Oscar, Mary Esther, and Y Y 15' quadrangles (P. W.) completed; Point Washington 15' quadrangle (P. W.) begun.

Georgia.—Warm Springs 15' quadrangle (P. W.) completed; Thomaston 15' quadrangle (P. W.) continued. Mapping without contours from aerial photographs completed for 7½' quadrangles within Hemp, Porter Springs, Blue Ridge, Randa, Blairsville, Cartecay, and Cohutta 15' quadrangles (T. V. A.).

Idaho.—American Falls No. 1, American Falls No. 2, and American Falls No. 3 15' quadrangles (P. W.) and Metaline 30' quadrangle (P. W.) completed; Yellow Pine No. 2 and Washington Creek No. 2 15' quadrangles (P. W.) and Mackay and Dickey 30' quadrangles (P. W.) begun.

Illinois.—Burlington, Oquawka, Iuka, Wenona, Morrison, and Lamotte 15' quadrangles completed; Keithsburg, Arcola, Shelbyville, Lovington, and Delavan 15' quadrangles continued; Minonk, Stewardson, and Miles 15' quadrangles begun in cooperation with the Department of Registration and Education of Illinois, Geological Survey. Sycamore, De Kalb, and Mattoon 15' quadrangles (P. W.) completed; Watseka and Pontiac 15' quadrangles begun.

Indiana.—Heltonville, Watseka, and Porter 15' quadrangles (P. W.) completed; Oolitic 15' quadrangle (P. W.) continued.

Iowa.—Melrose, McPaul, Iowa City, and Humeston 15' quadrangles (P. W.) completed.

Kansas.—W½ of Waldron 15' quadrangle (P. W.) and Armourdale No. 1, Olathe 1b, and Olathe 2a 7½' quadrangles (P. W.) completed.

Kentucky.—Munfordville and Cecilia 15' quadrangles (P. W.) completed. Mapping without contours from aerial photographs completed for Sneedville No. 2 quadrangle (T. V. A.).

Louisiana.—The Louisiana Board of State Engineers cooperating, mapping without contours from aerial photographs completed for 7½' quadrangles within Creole, Dulac, Pointe a la Hache, Crowley, Welsh, Jennings, Lafayette,

Sulphur, Donaldsonville, Bayou de Large, Dime, Chandeleur, Bodreau, Shell Beach, St. Bernard, Bonnet Carre, Spanish Fort, Chef Menteur, Toulme, Timbalier, Cheniere Caminada, Lake Felicity, East Delta, West Delta, Breton Island, Forts, Quarantine, Fort Livingston, La Fortuna, Cat Island, Rigolets, Mount Airy, Raccoon Point, Caillou Island, and Marsh Island 15' quadrangles. Contours for 7½' quadrangles within Chef Menteur, Spanish Fort, Bonnet Carre, New Orleans N½, and Hahnville N½ 15' quadrangles (P. W.) completed; contours for St. Bernard NW. quadrangle (P. W.) begun.

Maine.—In cooperation with the Public Utilities Commission of Maine, Mars Hill 15' quadrangle continued. Houlton, Burleigh, and Bridgewater Center 15' quadrangles (P. W.) completed; St. Croix 15' quadrangle (P. W.) and Acadia National Park (P. W.) begun.

Maryland.—Patuxent No. 2 E½ and Prince Frederick 15' quadrangles (P. W.) completed; Leonardtown 15' quadrangle (P. W.) begun.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, Wareham, Mount Tom, 7½' Plymouth, Easthampton, and Northampton No. 4 7½' quadrangles completed; Falmouth No. 1 and Northampton No. 1 7½' quadrangles begun. Worcester No. 4 7½' quadrangle (P. W.) completed; Webster No. 1 7½' quadrangle (P. W.) begun.

Michigan.—Merrill and Sanford 15' quadrangles (P. W.) and Toledo Nos. 1 and 2 7½' quadrangles (P. W.) completed; Cement City 15' quadrangle (P. W.) continued; Ithaca 15' quadrangle (P. W.) begun.

Minnesota.—Cochrane, Fountain City, Plainview, and Grand Forks 15' quadrangles (P. W.) and Grand Forks No. 1 7½' quadrangle (P. W.) completed; Rochester 15' quadrangle (P. W.) begun.

Mississippi.—Vicksburg National Military Park (P. W.) completed; Edwards 15' quadrangle (P. W.) continued. Mapping without contours from aerial photographs begun for 7½' quadrangles within Iuka 15' quadrangle (T. V. A.).

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri, Nebo, Berryman, Upalika, Hardin, Greenville, Elsberry, Zannoni, and Linn 15' quadrangles and Versailles 3a, Versailles 3c, Versailles 3d, Versailles 4a, Versailles 4b, Versailles 4c, Versailles 4d, Butler 4c, Butler 4d, Meramec State Park, Jefferson City 2a, Harrisonville 1b, Harrisonville 2a, Springfield 3a, Independence 3c, and Eldon No. 4 7½' quadrangles completed; Stone Hill and Kearney 15' quadrangles continued; Boss, Nevada No. 1, and Knobnoster 15' quadrangles and Stockton 2b, Independence 4d, Butler 3d, Clinton 3c, Warsaw 4d, Harrisonville 1a, Harrisonville 1c, Harrisonville 2c, Harrisonville 2d, Glasgow 4b, and Olathe 1d 7½' quadrangles begun. Armourdale No. 1, Armourdale No. 4, Independence 3a, Independence 4b, and Gravois Mills No. 4 7½' quadrangles (P. W.) completed; Eldon No. 3, Gravois Mills No. 3, Warsaw 1d, Warsaw 3a, Warsaw 4a, Warsaw 4b, Independence 3b, and Versailles 3b 7½' quadrangles (P. W.) and Morrison and Sullivan No. 2 15' quadrangle (F. E. R. A.) begun.

Montana.—Dupuyer No. 1 and Dupuyer No. 2 15' quadrangles (P. W.) and Thompson 30' quadrangle (P. W.) completed; Jennings and Silver Tip 30' quadrangles (P. W.) begun.

Nebraska.—Utica, Seward No. 1, and McPaul 15' quadrangles (P. W.) completed; Seward No. 4 15' quadrangle (P. W.) begun.

Nevada.—Skelton 30' quadrangle (P. W.) completed; Gold Creek No. 4 15' quadrangle (P. W.) continued; and Washoe district (P. W.) begun.

New Hampshire.—Mount Washington 15' quadrangle (P. W.) completed; Whitefield 15' quadrangle (P. W.) continued.

New Jersey.—Ramapo No. 4 and Paterson No. 1 7½' quadrangles (P. W.) completed; Paterson No. 4 7½' quadrangle (P. W.) begun.

New Mexico.—Arabela No. 3 15' quadrangle (P. W.), Potash special (P. W.), Albuquerque 4a, Albuquerque 4b, Albuquerque 4c, and Albuquerque 4d 7½' quadrangles (F. E. R. A.) completed; Los Lunas 1a 7½' quadrangle (F. E. R. A.) and Arabela No. 4 and Hillsboro Peak No. 1 15' quadrangles (P. W.) begun.

New York.—Rhinebeck 15' quadrangle completed and Poughkeepsie Nos. 2 and 3 7½' quadrangles begun, in cooperation with the Department of Public Works of New York. Saratoga No. 3, Saratoga No. 4, Quaker Springs, Castle Creek, and 7½' New London 7½' quadrangles (P. W.) completed; Schuylerville No. 4, Binghamton No. 1, and Binghamton No. 7½' quadrangles (P. W.) begun.

North Carolina.—Corundum, Banner Elk, and Ranger 15' quadrangles (P. W.) completed; Blowing Rock and Fanner 15' quadrangles (P. W.) continued. Mapping without contours from aerial photographs completed for 7½' quadrangles within Hayesville, Hemp, Ranger, Blue Ridge, Blairsville, Erwin, Montreat, Meat Camp, Mountain City, Highlands, Addie, Lake Toxaway, Mount Rogers, and Pattonville 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Tigersville, Edneyville, Arden, Democrat, and Brevard 15' quadrangles (T. V. A.).

North Dakota.—Grand Forks No. 1 7½' quadrangle (P. W.) and Grand Forks, Emerado, and Larimore No. 1 15' quadrangles (P. W.) completed; Larimore No. 2 and McVile 15' quadrangles (P. W.) begun.

Ohio.—Toledo No. 1, Toledo No. 2, Toledo No. 3, Toledo No. 4, and Maumee Bay No. 2 7½' quadrangles (P. W.) completed; McClure No. 1 and Swanton No. 4 7½' quadrangles (P. W.) begun.

Oklahoma.—Edmond 15' quadrangle (P. W.) and Edmond No. 3 7½' quadrangle (P. W.) completed.

Oregon.—McKenzie Bridge 30' quadrangle (P. W.) completed; Disston 30' quadrangle (P. W.) and extension of Crater Lake National Park (P. W.) continued.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, Allentown and Kane 15' quadrangles completed and Mount Jewett and Sheffield 15' quadrangles begun. Mifflintown 15' quadrangle (P. W.) completed; Needmore and Menno 15' quadrangles (P. W.) begun. Cultural revision completed for Cameron and Wheeling 15' quadrangles (P. W.).

Rhode Island.—Providence No. 3 7½' quadrangle (P. W.) completed.

South Carolina.—Greenville, Killian, Camden, and Wellford 15' quadrangles (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Timmons ville, Marion, and Florence 15' quadrangles (F. E. R. A.) and begun within Irmo and Fort Motte 15' quadrangles (F. E. R. A.).

South Dakota.—Fort Pierre No. 1 and Van Metre No. 1 15' quadrangles (P. W.) and Wind Cave National Park (P. W.) completed; Oacoma No. 2 15' quadrangle (P. W.) begun.

Tennessee.—Tellico 15' quadrangle (P. W.) completed; Fanner 15' quadrangle continued. Mapping without contours from aerial photographs completed for 7½' quadrangles within Damascus, Gate City, Elizabeth, Blountville, Robbinsville, Surgoinsville, Small, Sneedville, Johnson City, Grady, Erwin, Meat Camp, Mountain City, Tellico, Wallace, Dandridge, Pattonville, Mount Rogers, and Hagan 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Gillises Mills, Adamsville, Tate Springs, English Mountain, Straw Plains, Co-hutta, Midway, Conasauga, Ooltewah, Rogersville, Newport, and Sevierville 15' quadrangles (T. V. A.).

Texas.—Longview No. 3 15' quadrangle (P. W.) completed; Longview No. 2 and Dumas No. 4 15' quadrangles (P. W.) begun.

Utah.—A portion of Salt Lake County (P. W.) completed; Theodore 30' quadrangle (P. W.) continued; Elk Ridge 30' quadrangle (P. W.) begun.

Vermont.—In cooperation with the State geologist of Vermont, Woodsville 15' quadrangle continued. Wolcott 15' quadrangle (P. W.) completed; Wheelock 15' quadrangle (P. W.) begun.

Virginia.—Mount Rogers and Mouth of Wilson 15' quadrangles and Studley 7½' quadrangle completed and Charlottesville and Burkes Garden 15' quadrangles, Midlothian No. 1 and Midlothian No. 4 7½' quadrangles, and Charlottesville special begun in cooperation with the Conservation and Development Commission of Virginia, Geological Survey. Balcony Falls 15' quadrangle (P. W.) and Fredericksburg-Spotsylvania Battlefield National Monument (P. W.) completed; Vesuvius and Amherst 15' quadrangles (P. W.) begun. Mapping without contours from aerial photographs completed for 7½' quadrangles within Carterton, Damascus, Burkes Garden, Marion, Glade Spring, Gate City, Blountville, Rural Retreat, Wise, Robbinsville, Sneedville, Wallace, Mount Rogers, Hagan, Mouth of Wilson, Pound, Coeburn, Whitesburg, Pounding Mill, Big Stone Gap, Richlands, Nolensburg, Bucu, and Pattonville 15' quadrangles (T. V. A.).

Washington.—Mount Constance, Fort Simcoe, Eatonville, and Metaline 30' quadrangles (P. W.) and Troutdale 15' quadrangle (F. E. R. A.) completed; Marcus 30' quadrangle (P. W.) begun.

West Virginia.—Cultural revision completed for Richwood, White Sulphur Springs, Lobelia, Clintonville, Cameron, Wheeling, and Clarington 15' quadrangles (P. W.); Steubenville 15' quadrangle (P. W.) begun.

Wisconsin.—Chippewa Falls and Elk Mound 15' quadrangles (P. W.) completed; Osseo and Arkansas 15' quadrangles (P. W.) continued.

Wyoming.—Grand Encampment 30' quadrangle (P. W.) completed; Grand Teton National Park (P. W.) continued; Viola No. 2 15' quadrangle, Daniel W¼ 7½' by 30' quadrangle and Cokeville N½ 30' quadrangle (P. W.) begun.

Puerto Rico.—Parguera, Point Cabo Rojo, and Guanica 7½' quadrangles (P. W.) completed; Puerto Real, Sabana Grande, and San German 7½' quadrangles (P. W.) begun.

WATER-RESOURCES BRANCH

The importance of water and of records related to the quality, chemical character, and availability of both surface and ground waters becomes increasingly apparent each year. The growth of the country in population and industry, with consequent increases in demands for water, and especially the continued series of dry years that culminated in the disastrous and widespread drought in 1934 and the recent dust storms throughout the Central West, have served to impress on all the people the controlling importance of water in our surface streams and in underground basins in relation to many of man's activities. The Public Works Administration and related activities have found the information with respect to water to be invaluable in studies of projects of all classes and in all sections of the country and have relied on the records of the Geological Survey as a basis for action on many projects.

Reliable information with respect to these supplies of water and to their fluctuations with variations in rainfall is essential to orderly, stable, and economic development along many lines and, therefore, to the national welfare. The work of the water-resources branch thus assumes a position of great importance in the economic affairs of the Nation.

The investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations were conducted for the following Federal bureaus through advance, transfer, or repay of funds:

Department of Agriculture:

Bureau of Agricultural Engineering.

Weather Bureau.

Bureau of Biological Survey.

Soil Conservation Service.

Department of Commerce: Bureau of Air Commerce.

Department of the Interior:

Subsistence Homesteads.

Bureau of Indian Affairs.

Bureau of Reclamation.

National Park Service.

Department of the Navy: Bureau of Yards and Docks.

Department of State.

Department of War: Office of the Chief of Engineers.

Federal Power Commission.

Tennessee Valley Authority.

Federal Emergency Administration of Public Works.

States.—Amounts aggregating \$496,909.46 were made available by States and municipalities for cooperative surface- and ground-water investigations. In addition to the results obtained directly from cooperation, it is estimated that data valued at over \$115,000 were furnished by cooperating officials.

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the Commission to perform such field work as may be assigned to them by the Commission. The operation of about 310 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 129 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operations under permits and licenses of the Federal Power Commission in connection with 132 projects. Examinations and reports on applications for projects have been made for the Commission as requested.

WORK OF THE YEAR, BY DIVISIONS

The division of surface water conducts investigations of surface water, which consist of the measurement of the flow of rivers, conducted in the 48 States, the District of Columbia and Hawaii at selected gaging stations where the volume of water is measured and

records of stage and other data are collected, from which the daily discharge of the rivers is computed. In this work 41 States, the Territory of Hawaii, and several Federal bureaus and individuals cooperated in the maintenance of the 3,022 regular gaging stations that were in service at the end of the year. Records for about 113 additional gaging stations were received, ready for publication, from Federal bureaus and from individuals. There were 37,770 discharge measurements made during the year.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which the wells and springs are supplied); the surface, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for drilling wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year about 80 investigations relating to ground water and reservoir sites were in progress, and work was done in 32 States and in the Territory of Hawaii, in cooperation with State or local governmental agencies, or on Public Works Administration projects. In the hydrologic laboratory 126 samples of water-bearing material were analyzed.

The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as such use is affected by the dissolved mineral matter. The analysis (partial or complete) of 1,387 samples of water, including some for nearly all the studies of ground water in the different States, was completed during the year.

The work of the division of power resources comprised the preparation of monthly and annual reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported. The monthly reports also include, through cooperation with the Bureau of Mines, comparative figures of the stocks of bituminous and anthracite coal on hand at electric public

utilities, the monthly consumption of coal, and the number of days supply of bituminous and anthracite coal on hand at the current rate of consumption. The annual report contains revised figures of the monthly production of electricity and consumption of fuel in 1934 previously published in the monthly reports, a summary of the annual reports from 1919 to 1934, the average annual rate of consumption of coal and the coal equivalent of oil and gas in generating 1 kilowatt-hour of electricity from 1919 to 1934, and the annual exports and imports of electricity between the United States and Canada and Mexico for certain years. A report of the capacity of water wheels in the United States on January 1 was also prepared. The final report of the monthly and annual production of electricity for public use in 1934 was released April 20, 1935. The annual report of the capacity of water wheels in water-power plants in the United States was released January 24, 1935.

The division of water utilization investigates problems affecting the utilization and control of the waters of streams and performs administrative work relating to supervision and investigation of these problems by the field organization of the water-resources branch and of power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water. In collaboration with the Mississippi Valley Committee of the Public Works Administration studies were made of floods in the United States, with especial reference to their magnitude and frequency, and of the relations of rainfall and run-off in the United States. A report on the flood study was completed and sent to the printer, and a report on the rainfall and run-off study was practically completed by the end of the year.

CONSERVATION BRANCH

The regular work of the conservation branch was retarded during the fiscal year 1935 by insufficient funds and personnel. Office phases of the work were maintained reasonably current until March, when congestion developed in consequence of the receipt for technical consideration of a large number of proposed unit plans of development and operation, submitted by Federal oil and gas permittees in compliance with departmental requirements. This congestion increased steadily thereafter and attained serious proportions before the end of the year. Field phases of branch work were necessarily neglected in all lines except power classification and agricultural classification, where funds from extra-branch sources made possible the conduct of several needed surveys. Geologic

work was possible in only two small areas, and field inspection of mines and of oil and gas operations, already far in arrears, was further attenuated by the necessary detail of supervisory personnel to Public Works projects and by an abnormal increase in new properties and new operations to be supervised.

By departmental order 884, effective March 21, 1935, the work of agricultural and grazing classification was transferred to the departmental Division of Grazing, and the office and field personnel of the branch engaged in that work was detailed to that division for the remainder of the year.

MINERAL-CLASSIFICATION DIVISION

The work of the mineral-classification division was restricted rather closely to office phases and was materially impeded by the negligible inflow of basic data from the field. The trend of division activity from strict classification to phases concerned with administration of the mineral leasing law was accentuated by the assignment to the division of the responsibility for determining the areas subject to logical unitization under plans for unit or cooperative development submitted by the holders of Federal oil and gas prospecting permits. Appreciable progress was made, nevertheless, in classifying the vast areas of public land withdrawn early in the century for examination and classification as to mineral. Classifications effected include 224,444 acres as coal land, 661,091 acres as noncoal land, 19,211 acres as oil-shale land, and 248,473 acres as non-oil-shale land.

In addition to the technical adjudication of 2,003 applications for mineral prospecting permit, 118 applications for mineral lease, and 859 conflicts or anticipated conflicts between mineral applicants and surface-right applicants; the technical review and endorsement of 732 assignments, coal-permit extensions, lease and license authorizations; the preparation of 1,648 decisions for the departmental committee affecting the extension of oil and gas prospecting permits and potash permits; and the consideration of some 30 plans of unit operation and development for oil and gas fields or areas, definitions of the "known geologic structure" of two producing oil and gas fields were prepared and promulgated, as follows: Last Chance, Utah, February 23, 1935, 26,480 acres; Rex Dome (addition), Wyo., November 21, 1934, 80 acres. The outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1935, amounted to 986,906 acres in California, Colorado, Montana, New Mexico, Oklahoma, Utah, and Wyoming.

WATER AND POWER DIVISION

The work of obtaining basic information as to the water-power resources and storage possibilities of public lands was directed chiefly to field phases. The continued availability of Public Works funds made possible the completion of river-utilization surveys involving some 1,900 linear miles of streams in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, with supplemental geologic and geophysical studies of foundation materials and conditions at 14 dam sites in Montana.

Office activities, expanded during the year to include duties involving Carey Act projects, irrigation projects, and reservoir-site reserves, formerly performed by the agricultural division but not transferred to the division of grazing, were necessarily reduced to the minimum. In addition to their showing in the general summary of cases they included action resulting in additions of 72,793 acres to outstanding water-power reserves in 11 public-land States and eliminations of 408,157 acres from such reserves in 8 States, with net decrease of the total reserved area in 22 States to 6,465,007 acres at the end of the year. Field supervision of power projects for the Federal Power Commission involved investigations and report on 15 projects, supervision of construction and operations under 132 projects, and studies of cost accounting on 5 projects.

Statistics compiled by the division show that the holders and users of rights of way for power purposes granted by the Secretary of the Interior had for the calendar year 1934 aggregate installed horsepower of 3,139,010, including 2,094,964 at hydraulic plants and 1,044,046 at fuel plants, and aggregate energy generation of 6,930,000,000 kilowatt-hours, which is less by 25 percent than the production in 1933 because of the elimination of one large producer from the roster of departmental grantees during 1933. Revenues accrued to the Government from these grants aggregate \$205,680 from 1912 to 1934, and \$15,663 additional has been assessed for the calendar year 1935. Accrued charges for unauthorized occupancy of public lands by power projects prior to the issuance of license therefor by the Federal Power Commission amount to \$112,230 additional, about \$12,000 of which is in litigation.

AGRICULTURAL DIVISION

Until its functions of agricultural and grazing classification were transferred to the departmental Division of Grazing, March 21, 1935, the work of the agricultural division was restricted chiefly to office phases and to cooperation with departmental officials in preparing and promulgating regulations for effectuating the purposes of the

Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), in organizing the departmental Division of Grazing, in conducting public hearings throughout the West to explain the purposes of the grazing act and the procedure of grazing-district organization, and in the conduct of reconnaissance surveys of grazing resources and conditions in several districts established under said act.

Although the filing of applications for agricultural classification and for designations under the stock-raising and enlarged homestead laws and the Nevada ground-water law was essentially terminated by the withdrawals approved by Executive order of November 26, 1934, the number of unadjudicated applications for rights under these laws transferred to the Division of Grazing on March 31, 1935, aggregated 1,999, an increase of 6.5 percent over the number pending at the beginning of the fiscal year.

Accomplishments prior to the transfer of function, not indicated in the general summary of cases, included the designation of 35,450 acres in 15 States as subject to entry under the Stock Raising Homestead Act and the cancelation of prior designations of 16,945,535 acres under that act, with net reduction of the outstanding designated area in 20 States to 102,429,247 acres; the designation of 1,894 acres in 7 States as enterable under the Enlarged Homestead Act and the cancelation of prior designations of 25,947,994 acres in 5 States, with net reduction of the outstanding designated area in 14 States to 268,467,585 acres; the inclusion of 12,480 acres in 11 States in public water reserves and the exclusion of 460 acres in 3 States from such reserves, with net increase of the gross area reserved in 13 States to 506,748 acres; and the designation of 2,600 acres under the Nevada Ground Water Act, with increase of the aggregate area so designated to 1,732,095 acres. Liaison service was maintained for the Interior Department with the Committee for Acquisition of Submarginal Land, of the Federal Emergency Relief Administration, and cooperative studies of the grazing and farm resources of Arizona, with the University of Arizona and the United States Forest Service, were continued.

MINING AND OIL- AND GAS-LEASING DIVISION

The work of the mining and oil- and gas-leasing divisions, consisting of inspectional and regulatory supervision of mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves, increased notably in volume and in difficulty of effective performance in the fiscal year 1935.

Public lands.—The number of public-land properties under supervision increased 17 percent, to a total of 8,394, involving 10,866,120 acres in 20 States and Alaska, and in the absence of sufficient funds for the most effective use of available personnel or for needed re-

placements and increase in supervisory forces the essential work of property inspection, already far in arrears, was perilously meager. With the aid of funds allotted in 1933 by the Public Works Administration the supervisory force was maintained essentially intact, though available only in part for regular inspectional and regulatory work, and was enabled to accomplish important conservational and remedial results outlined more fully under the heading "Public Works projects."

The work of the oil- and gas-leasing division was vastly increased in 1935, both in Washington and in the field, by the necessity of assisting oil and gas permittees in fulfilling departmental requirements for the submission of unit or cooperative plans of operation and development involving permit acreage, and of reviewing and revising the engineering and royalty features of such plans after their submission.

Three unit plans were completed and approved during the year—for the Round Mountain field, California, the Fourbear field, Wyoming, and for unit 5 of the Cedar Creek field, Montana—and at the end of the year about 400 other plans were awaiting technical consideration in the Washington office alone, with little prospect of timely consideration by the small and fully preoccupied personnel available. The work of this division was further increased by departmental regulations approved October 23, 1934, under the O'Mahoney Water Act, of June 16, 1934 (48 Stat. 977), to include remedial work necessary to preserve and make accessible water supplies found in wells drilled for oil and gas on public land and determined to be valuable for agricultural, domestic, or other purposes.

Drilling activity on public lands during the year included the spudding of 203 new wells and the completion of 268 others, 120 of which were productive of oil or gas and 148 barren. The total number of wells under supervision at the end of the year was 7,200 in 15 States and Alaska, including 3,699 capable of oil or gas production. The production of petroleum, natural gas, and natural gasoline from public land in 1935 was substantially greater than in other recent years, and the revenues accrued therefrom were materially increased.

The regular work of the mining division, involving Federal properties under development or exploration for coal, potash, sodium, phosphate rock, sulphur, and oil shale, increased moderately in the fiscal year 1935, but its performance was subordinated, by necessity, to remedial activities financed by Public Works funds. Coal properties under supervision in 14 States and Alaska increased 28, to a total of 758; potash properties in 8 States decreased 8, to a total of 204; sodium properties in 9 States increased 6, to a total of 45; and sulphur properties in 1 State increased 4, to a total of 26.

The number of phosphate properties (8 in 3 States) and of oil-shale properties (1) remained unchanged. Mineral prospecting during the year included 30 holes with aggregate of 14,957 feet, drilled for coal in Wyoming; 3 holes, 2,546 feet, drilled for sodium in California; and 5 holes, 5,331 feet, drilled for potash in New Mexico, as well as innumerable shallow holes and surface excavations in all public-land States. Safety and welfare conditions on mining properties under supervision remained generally satisfactory throughout the year, five coal properties receiving awards and one coal operator a trophy from the Joseph A. Holmes Safety Association, for outstanding accident-free accomplishment.

Indian lands.—On behalf of the Office of Indian Affairs technical supervision of mineral development was continued in 1935 on tribal and restricted allotted lands within the limits of numerous Indian reservations. Oil and gas supervision involved 4,812 leaseholds, 4,477 wells, and aggregate royalty and rental accruals of \$338,164.63 for Indian beneficiaries in 7 States and in 27 different tribes and included royalty accounting for certain agencies, appraisals of bonus and royalty offers and of pollution damages, assistance to lessees of Indian land on operating problems and in the preparation of unit plans of development, and assistance to agency officials and tribal councils on technical phases of leasehold development and administration. Mining supervision involved 36 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of \$216,557.04 during the year; 39 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes land in Oklahoma, with aggregate production of 860,033 tons of coal and revenue accruals of \$103,505.05; 1 asphalt lease involving segregated Choctaw and Chickasaw land, Oklahoma; 1 lime phosphate lease involving restricted allotted Five Tribes land, Oklahoma; and several scattered agency coal mines in the Western States. It included also special investigations of mining and marketing procedure under an asbestos leasehold in the San Carlos Reservation, Ariz., and of feasible methods of controlling coal-mine fires affecting lands in the Crow and Fort Peck Reservations, Mont.

Naval petroleum reserves.—On behalf of the Navy Department supervision was continued during the year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Naval Petroleum Reserve No. 3, in Wyoming. Production from the California reserves aggregated 3,415,743.46 barrels of petroleum, 3,633,889,000 cubic feet of natural gas, and 12,841,346.20 gallons of natural gasoline, and had an aggregate royalty value of \$561,541.31.

PUBLIC WORKS PROJECTS

Under the supervision of conservation branch personnel aggregate expenditures of \$535,872.05 were made during the fiscal year 1935 from funds allotted by the Public Works Administration in 1933, for field investigations and conservational work pertinent to branch functions. On four Federal projects \$1,875.75 was expended for repairs and improvements at field camps maintained for branch employees at Taft, Calif., and Midwest, Wyo. On 11 projects \$179,058.86 was expended for utilization surveys of power and storage resources of important streams in 11 public-land States. On 13 projects \$354,934.44 was expended in 11 States in the plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands and thereafter improperly abandoned or merely deserted; in extinguishing or controlling coal-outcrop fires, and in filling, bulkheading, or otherwise safeguarding abandoned mine or prospect openings on public and Indian lands; and in surface studies of coal occurrence and subsurface studies of oil and gas occurrence in Indian lands in Oklahoma. Work was terminated under practically all these projects on or before June 30, 1935, by reason of the exhaustion of funds originally allotted. On a few projects unexpended balances were available and work was continued beyond the end of the fiscal year under authority of the President.

SUMMARY OF FIELD ACTIVITIES, BY STATES

Alabama.—Visited oil and gas prospecting operations throughout the State in aid of mineral classification. Examined one tract in Fayette County for adjudication of conflicting mineral and nonmineral filings. Supervised 1 lease for coal and 1 lease and 1 prospecting permit for oil and gas.

Alaska.—Supervised 1 power project; 2 leases, 1 license, and 9 prospecting permits for coal; and 100 prospecting permits for oil and gas.

Arizona.—Supervised 25 power projects, completed 111 miles of stream-utilization surveys on Little Colorado, Verde, Williams, Gila, and San Francisco Rivers and examined the Williams reservoir site. Conducted range-classification studies and participated in grazing-law hearings at Prescott and Phoenix. Supervised on public land 2 prospecting permits for coal, 6 for potash, 4 for sodium, and 62 for oil and gas; and on Indian land, 2 leases for oil and gas.

Arkansas.—Visited oil and gas prospecting operations in the western part of the Arkansas Valley in aid of mineral classification and examined for minerals lands in Logan and Yell Counties sought for recreational purposes by the State. Supervised 1 power project and 7 oil and gas prospecting permits.

California.—Supervised 90 power projects, completed 237 miles of stream-utilization surveys on Kern, Sacramento, and Yuba Rivers and Putah and Clear Creeks, and mapped in detail the Kennett, Kiswick, Whiskeytown, Anthony House, Upper Nanous, Copoy, and Monticello reservoir sites. Con-

ducted range-classification studies in Grazing Districts Nos. 1 and 2 and participated in grazing-law hearings at San Francisco, Bakersfield, and Alturas. Supervised on public land 4 prospecting permits for coal, 2 for potash, 18 for sodium, and 980 for oil and gas, also 3 leases for potash and 214 for oil and gas; and on naval petroleum reserves 24 leases for oil and gas.

Colorado.—Examined land on the Garmesa anticline to determine the source of seepage gas. Supervised 13 power projects, completed 176 miles of stream-utilization surveys on Gunnison, Lake Fork of Gunnison, Crystal, and Yampa Rivers and Roaring Fork, Cattle, and Frying Pan Creeks, and mapped in detail the Trujillo and Arboles reservoir sites, also 15 minor reservoir sites and 5 dam sites. Participated in grazing-law hearings at Glenwood Springs and Grand Junction. Supervised on public land 83 leases for coal, 1 for sodium, and 26 for oil and gas, 17 licenses for coal, 52 prospecting permits for coal, 1 for potash, and 541 for oil and gas; and on Indian land 7 leases for oil and gas.

Florida.—Visited oil and gas prospecting operations throughout the State and examined 1 tract each in Glades, Levy, Marion, and Suwannee Counties and 2 each in Dixie and Lafayette Counties for purposes of mineral classification.

Idaho.—Supervised 34 power projects, completed 132 miles of stream-utilization surveys on Snake, Kootenai, North Fork of Coeur d'Alene, and Priest Rivers and mapped in detail the Rush Beds and Black Canyon reservoir sites and 6 dam sites. Conducted range-classification studies in the southern part of the State, including investigations to determine well-drilling sites for the development of stock water, and participated in grazing-law hearings at Boise. Supervised 1 lease and 17 prospecting permits for coal, 2 leases for phosphate rock, and 76 prospecting permits for oil and gas.

Kansas.—Supervised 17 prospecting permits for oil and gas.

Louisiana.—Visited oil- and gas-prospecting operations throughout the State in aid of mineral classification. Supervised 11 leases for oil and gas.

Mississippi.—Visited oil- and gas-prospecting operations throughout the State and examined one tract in George County for purposes of mineral classification. Supervised 1 prospecting permit for oil and gas.

Montana.—Supervised 35 power projects, completed 260 miles of stream-utilization surveys on Blackfoot, Flathead, Kootenai, and Ruby Rivers, mapped in detail the Hungry Horse and Ruby reservoir sites, and made geologic and geophysical surveys of 14 dam sites. Conducted range-classification studies in Grazing District No. 1 and participated in grazing-law hearings at Billings and Malta. Supervised on public land 94 leases, 49 licenses, and 41 prospecting permits for coal, 5 leases for phosphate rock, 1 prospecting permit for potash, and 88 leases and 775 prospecting permits for oil and gas and on Indian land 68 leases for oil and gas.

Nebraska.—Supervised one prospecting permit for potash.

Nevada.—Supervised 17 power projects, completed 77 miles of stream-utilization surveys on Muddy, Little Humboldt, and Carson Rivers, and mapped in detail the Narrows reservoir site, 7 minor reservoir sites, and 3 dam sites. Participated in grazing-law hearings at Reno. Supervised 5 prospecting permits for coal, 1 for sodium, 7 for potassium, and 70 for oil and gas, and 1 lease for phosphatic material.

New Mexico.—Supervised 6 power projects, completed 268 miles of stream-utilization surveys on Chama, Grande, Gila, and Pecos Rivers and Willow Creek, and mapped in detail the Elvado reservoir site. Participated in grazing-law hearings at Albuquerque. Supervised on public land 25 leases and 26 prospecting permits for coal, 9 leases and 158 prospecting permits for potash, 12 prospecting

permits for sodium, 26 prospecting permits for sulphur, and 117 leases, 1,502 prospecting permits, and 8 suspended preference-right leases for oil and gas and on Indian land 9 leases for oil and gas.

North Dakota.—Participated in grazing-law hearings at Bismarck. Supervised 72 leases, 20 licenses, and 1 prospecting permit for coal and 21 prospecting permit for oil and gas.

Oklahoma.—Supervised 3 power projects. Supervised on public land 26 prospecting permits and 16 leases for oil and gas and on Indian land 4,704 leases for oil and gas, 39 leases for lead and zinc, and 31 leases, 3 awarded leases, 9 prospecting permits, and 5 awarded permits for coal.

Oregon.—Supervised 40 power projects, completed 129 miles of stream-utilization surveys on Hood and Umatilla Rivers and Gales and Willamina Creeks, and mapped in detail the Umatilla and Catherine Creek reservoir sites and 5 minor reservoir sites. Participated in grazing-law hearings at Klamath Falls, Burns, and Vale. Supervised 1 lease and 4 prospecting permits for coal, 2 prospecting permits for sodium, 107 prospecting permits for oil and gas, and 1 lease for oil shale.

South Dakota.—Participated in grazing-law hearings at Rapid City. Supervised 4 leases, 3 licenses, and 2 prospecting permits for coal and 38 prospecting permits for oil and gas.

Utah.—Supervised 18 power projects and completed the mapping of the Huntington Creek reservoir site. Participated in grazing-law hearings at Salt Lake City. Supervised on public land 41 leases, 3 licenses, and 81 prospecting permits for coal, 10 prospecting permits for sodium, 23 prospecting permits for potassium, and 11 leases and 597 prospecting permits for oil and gas and on Indian land 2 leases for oil and gas.

Washington.—Supervised 20 power projects, completed 260 miles of stream-utilization surveys on Clark Fork, Nooksack, Similkameen, Quinault, Hump-tulips, and Satsop Rivers and Sheep and Chewack Creeks, and mapped in detail 11 dam sites and numerous minor reservoir sites. Supervised 1 lease and 18 prospecting permits for coal, 1 prospecting permit for sodium, and 10 prospecting permits for oil and gas.

Wisconsin.—Supervised 1 power project.

Wyoming.—Made detailed geologic surveys of the Garland anticline, Big Horn and Park Counties, and the Osage oil and gas field, Weston County, for purposes of mineral leasing-law administration. Supervised 10 power projects, completed 296 miles of stream-utilization surveys on Laramie, Bear, and Green Rivers, and mapped in detail 2 dam sites and several minor reservoir sites. Participated in grazing-law hearings at Casper. Supervised on public land 48 leases, 28 licenses, and 60 prospecting permits for coal, 1 prospecting permit for sodium, and 414 leases, 1,510 prospecting permits, and 4 suspended preference-right leases for oil and gas and on Indian land 69 leases for oil and gas.

WORK ON PUBLICATIONS

Texts.—The book publications of the year in the regular series numbered 35, covering 3,509 pages. Besides these publications, 36 brief papers in mimeographed form were issued as memoranda for the press. During the year 16,213 pages of manuscript were edited and prepared for printing, and 3,085 galley proofs and 10,414 page proofs were read and corrected. Indexes were prepared for 36 publications, covering 6,050 pages. Copy and proof or

pencils for 1,336 pages of multigraph and mimeographed matter were read. In addition to the Survey work, the proof of the volume on copper resources of the world, to be published by the International Geological Congress, was read as time was available.

Illustrations.—The section of illustrations prepared 2,088 drawings and photographs, transmitted 468 illustrations to accompany 26 reports, received and examined 539 proofs, and examined 32 editions. The work included considerable drafting for the Public Works Administration and the Office of Education.

Geologic editing and drafting of maps and illustrations.—The color proof of the geologic map of Colorado, scale 1:500,000, was read, and corrections of color stones were made for the eastern half and begun for the western half. The geologic map of Texas, scale 1:500,000, was drawn, and one section of the map was sent for engraving. The Somerset-Windber, Pa., folio (no. 224) was completed. Illustrations for 21 papers were edited. The section made 20 drawings for papers to be published by State geological surveys or other outside organizations and 134 drawings for the Public Works Administration.

Engraving and printing.—During the year 83 newly engraved topographic maps were printed, including 4 revised maps (of this number 47 were completed under the Public Works allotment), and 3 special maps were printed, making a total of 86 new maps printed and delivered. Corrections were engraved on the plates of 125 maps. Reprint editions of 128 engraved topographic maps and 11 photolithographed State and other maps were printed and delivered. In addition, 50 new topographic maps had been engraved and were in press June 30, including 17 under Public Works allotment, and the engraving of 41 other new topographic maps was nearly completed, including 16 under Public Works allotment. One new geologic folio was printed, the edition amounting to 600 copies. Of new and reprinted maps, 226 different editions, amounting to 580,689 copies, were delivered.

A large amount of work was done for more than 60 other units of the Government and State governments, and the charges for it amounted to about \$190,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed. Of topographic maps, geologic maps, and contract and miscellaneous work of all kinds, a grand total of 4,688,839 copies were printed and delivered.

The output of the photographic laboratory consisted of 15,902 negatives (including 6,152 wet plates for photolithographs, 990 wet plates for photographic prints, 23 paper negatives, 1,994 dry plates, 1,066 lantern slides, and 5,677 field negatives developed), 29,888

prints (including 2,946 maps and diagrams, 25,876 photographs for illustrations and records, and 1,066 bromide enlargements), 5,278 zinc plates, 206 intaglio etchings, 13 celluloid prints, and 3,108 prints mounted.

Distribution.—A total of 260 publications, comprising 35 new books and pamphlets, 86 new or revised topographic and other maps, and 139 reprinted topographic and other maps were received during the year. Several special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 70,462 books and pamphlets and 580,089 topographic and other maps, a grand total of 650,051. The division distributed 61,665 books and pamphlets, 2,887 geologic folios, and 693,861 maps, a grand total of 758,413, of which 2,315 folios and 543,877 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were \$32,957.12, including \$32,318.31 for topographic and geologic maps and \$638.81 for geologic folios. In addition \$6,940.24 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$39,897.36.

LIBRARY

The resources of the library have been increasingly utilized by the newer agencies of the Government. The total number of readers using the library during the year was 14,089, of whom 7,822 were not members of the Geological Survey. These figures may be compared with those of 1932, when the total number of readers was 7,614, of whom 2,111 were not members of the Survey. Loans outside of the library for the year were 9,038, an increase over 1932 of 40 percent.

The bibliography of North American geology for 1933-34 was completed. Two cooperating staffs have continued the use of the library facilities in the compilation of the bibliography of foreign geology and the annotated bibliography of economic geology.

The Emergency Relief Administration project was discontinued in September. The personnel employed on the project, numbering over 100, was utilized in mending and labeling books, sorting duplicate material, and classifying and cataloging most of the remainder of books and pamphlets of the Kunz collection.

Several lists of references were prepared by the library staff. The subjects covered were the Geological Survey, the Public Works Administration, Federal regulation of the petroleum industry, and the Soil Erosion Service.

The accessions during the year comprised 15,264 books, pamphlets, periodicals, and serial parts and 1,202 maps.

APPROPRIATIONS AND EXPENDITURES

The appropriations made directly for the work of the Geological Survey for the fiscal year 1935 included 11 items, amounting to \$1,313,500. In addition, \$237,602.54 of the balances for 1934 was continued available for use in 1935, and \$80,036 was transferred to the Geological Survey from the indefinite appropriations for salary restorations. A total of \$1,631,138.54 was thus made directly available to the Geological Survey by Congress, of which \$46,780.70 remained unobligated on June 30, 1935. In addition, \$5,632 was allotted from appropriations for the Interior Department for miscellaneous supplies.

Topographic survey of the United States, July 1, 1934 to June 30, 1935, and total area surveyed in each State

State	Publication contour interval (feet)	Mapped in fiscal year (square miles) (for engraved publication unless otherwise stated) on scale of 1 to—					Total area mapped in fiscal year (square miles)				Total area mapped to June 30, 1935 (square miles)	Per-centage of total area of State mapped to June 30, 1935	Spirit levels (miles)	Transit traverse (miles)	Triangu-lation stations occupied	
		9,600	24,000	31,680	48,000	62,500	125,000	Plani-metric map-ping	Standard mapping with contours							
									Revi-sion 1	Resur-survey 2						New sur-survey 3
Alabama	20		4 70			370		70		99	271	21,834	42.0		54	
Arizona	25, 50					548				384	422	60,169	52.8	26		
Arkansas	5, 10, 20			168		804				480	492	23,631	44.3	223	242	6
California	5, 25, 100		247				636			429	454	133,047	84.0	48		40
Colorado	10, 20, 50, 100			47		712	5			392	372	56,980	54.8	20		
Connecticut	10			84						84		4,965	100.0	8		
Delaware	10											2,370	100.0			
District of Columbia												70	100.0			
Florida	10					446					446	5,949	10.1			
Georgia	20		4 729			165		729		17	148	25,100	42.4			84
Idaho	10, 50, 100					617	874			112	1,379	34,283	40.9	769		27
Illinois	10, 20					1,346				1	1,272	38,968	68.8	136		
Indiana	10, 20					407					407	4,092	11.3			
Iowa	20					721				1	177	13,710	24.4	68	78	
Kansas	10		4 7	119		22					141	64,446	78.4	201	53	3
Kentucky	20					204		7			204	27,120	66.8		442	
Louisiana	5		5, 887					5,363		524		11,350	23.4	140	10	
Maine	10, 20			102		710				102	710	21,694	63.7	174		
Maryland	20					226				226		12,327	100.0			
Massachusetts	10			378						378		8,266	100.0	329		
Michigan	10			19						19	625	14,694	25.3	10	104	
Minnesota	5, 10			14		625					625	8,781	10.4	108		
Mississippi	5, 20		4 52			553		52		8	234	7,244	15.5	210	4	
Missouri	10, 20	8		1,348		234				9	933	49,708	71.6	8		
Montana	5, 10, 20					342	561				903	44,431	30.2	458	8	
Nebraska	25, 100					515					515	27,867	35.9	132	66	
Nevada	10, 20			6 28		88	550				638	54,356	43.1	124		22
New Hampshire	25, 50, 100					248				248		9,302	100.0	100		
New Jersey	20			122						122		8,224	100.0			
New Mexico	10			270		998				270	998	44,675	36.4	27	222	
New York	10, 20			268		13				271		49,204	100.0	576	26	215
North Carolina	50		4 1,743			406		1,743		406		19,040	36.3	36	187	
North Dakota	5, 10			16		821					837	14,005	19.8		292	

	5, 20	230	1	952	1	230	1	230	100.0	122	86
Ohio.....	5, 20	---	---	---	---	---	---	---	41,040	---	---
Oklahoma.....	10	---	94	---	---	129	---	---	41,927	---	---
Oregon.....	50, 100	35	300	---	128	172	---	952	37,884	270	26
Pennsylvania.....	20	---	1,178	---	36	746	---	396	39,156	232	135
Rhode Island.....	10	56	---	---	---	56	---	---	1,248	---	85
South Carolina.....	20	---	394	---	---	---	---	394	14,967	---	---
South Dakota.....	20	18	457	---	1,015	---	---	---	1,248	---	---
Tennessee.....	50	---	189	---	3,506	---	---	---	19,812	79	---
Texas.....	20	---	559	---	---	189	---	---	23,633	---	7,100
Utah.....	5, 20, 100	7 23	---	595	---	---	---	---	89,890	43	---
Vermont.....	20	---	318	---	---	36	---	559	20,550	87	10
Virginia.....	10, 20, 50	71	583	---	---	657	---	---	8,564	126	---
Washington.....	25, 50, 100	---	154	---	3,236	---	---	318	37,897	690	28
West Virginia.....	20, 50	---	1,390	1,907	---	---	---	2,061	39,662	411	---
Wisconsin.....	20	---	372	---	1,382	8	---	---	24,170	---	---
Wyoming.....	5, 20, 50, 100	---	122	1,024	---	122	225	799	19,609	67	139
Total in continental United States (exclusive of Alaska).....	8	10,618	258	7,104	15,721	1,895	8,782	20,247	46.7	6,601	9,204
Hawaii.....	---	---	---	---	---	---	---	---	100.0	---	---
Puerto Rico.....	9 1.5	10 154	---	---	---	---	---	154	---	141	27

¹ Revision mostly of culture only.

² Resurveys in large part cover areas previously surveyed on a smaller scale.

³ New surveys cover areas not heretofore mapped.

⁴ Prepared from aerial photographs with field examination and showing culture, drainage, and woodland but no contours. Reproduction by 3-color photolithography (planimetric mapping).

⁵ Includes 5,363 square miles planimetric mapping (see footnote 4) and 524 square miles with contours, publication by 4-color photolithography.

⁶ Reproduction by 1-color photolithography.

⁷ Linear miles of river surveys.

⁸ Includes 3,236 square miles planimetric mapping (see footnote 4) and 3 square miles with contours, reproduction by 1-color photolithography.

⁹ Meters.

¹⁰ Publication scale 1:30,000.

Cooperative State and municipal funds available for work on water-resources investigations, fiscal year 1935

State	State funds available		Municipal funds available		Total
	Surface water	Ground water	Surface water	Ground water	
Alabama.....	\$2,000.00	-----	-----	-----	\$2,000.00
Arizona.....	13,835.89	-----	-----	-----	13,835.89
California.....	26,825.65	\$17,571.93	-----	\$5,000.00	49,397.58
Colorado.....	25,177.09	-----	\$500.00	-----	25,677.09
Connecticut.....	6,000.00	100.00	-----	-----	6,100.00
Florida.....	4,007.30	2,200.00	-----	-----	6,207.30
Hawaii.....	12,812.22	-----	7,706.59	-----	20,518.81
Idaho.....	22,076.92	-----	-----	-----	22,076.92
Illinois.....	5,428.13	-----	-----	-----	5,428.13
Indiana.....	4,000.00	300.00	-----	-----	4,300.00
Iowa.....	5,008.00	-----	-----	-----	5,008.00
Kansas.....	5,798.33	-----	-----	-----	5,798.33
Louisiana.....	410.01	-----	-----	-----	410.01
Maine.....	6,500.00	-----	-----	-----	6,500.00
Maryland.....	7,509.14	1,750.00	-----	-----	9,259.14
Massachusetts.....	4,298.00	1,450.00	-----	-----	5,748.00
Michigan.....	3,700.00	-----	2,500.00	-----	6,200.00
Minnesota.....	7,704.47	-----	-----	-----	7,704.47
Mississippi.....	953.63	-----	-----	-----	953.63
Missouri.....	8,675.69	188.98	-----	-----	8,864.67
Montana.....	9,515.40	-----	-----	-----	9,515.40
Nebraska.....	12,000.00	-----	4,000.00	-----	16,000.00
Nevada.....	700.00	-----	-----	-----	700.00
New Hampshire.....	5,435.19	-----	-----	-----	5,435.19
New Jersey.....	7,800.00	3,500.00	5,625.00	-----	16,925.00
New Mexico.....	17,152.61	-----	3,592.40	-----	20,745.01
New York.....	17,615.00	7,012.00	2,000.00	6,363.35	32,990.35
North Carolina.....	6,710.05	-----	-----	-----	6,710.05
North Dakota.....	165.20	-----	-----	-----	165.20
Ohio.....	16,935.42	2,000.00	-----	-----	18,935.42
Oregon.....	24,477.44	770.00	-----	-----	25,247.44
Pennsylvania.....	18,588.29	-----	1,826.21	-----	20,414.50
South Carolina.....	3,000.00	353.22	-----	-----	3,353.22
Tennessee.....	9,459.69	-----	1,000.00	-----	10,459.69
Texas.....	17,767.50	-----	9,744.77	-----	27,512.27
Utah.....	5,500.00	69.82	-----	3,864.41	9,434.23
Vermont.....	2,284.00	-----	-----	-----	2,284.00
Virginia.....	19,000.00	-----	156.00	-----	19,156.00
Washington.....	12,414.17	5,057.85	-----	-----	17,472.02
West Virginia.....	3,000.00	-----	-----	-----	3,000.00
Wisconsin.....	7,000.00	-----	-----	-----	7,000.00
Wyoming.....	11,466.50	-----	-----	-----	11,466.50
Total.....	400,706.93	42,323.80	38,650.97	15,227.76	496,909.46

General summary of cases involving land classification

Class of cases	Record for fiscal year 1935						Record since receipt of first case	
	Pending prior to July 1, 1934	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1935	Gain or loss ¹ during fiscal year	Received	Acted on
General Land Office requests:								
General.....	123	1,849	1,972	1,891	81	+42	2,313	2,313
Time extensions.....	11	95	106	92	14	-3	17,389	17,375
Oil developments.....	54	736	790	732	58	-4		
Concurrence.....	130	1,519	1,649	1,648	1	+129	12,751	12,750
Committee cases—Oil and potash.....								
Applications for classification as to mineral:								
Oil.....	144	1,264	1,408	1,232	176	-32	27,420	27,244
Miscellaneous.....	1	16	17	16	1		933	932
Applications for mineral permits.....	269	1,767	2,036	2,003	33	+236	61,327	61,294
Applications for mineral leases.....	11	127	138	118	20	-9	2,145	2,125
Applications for patent, potassium.....							124	124
Federal Power Commission cases:								
Preliminary permits.....	2	33	35	23	12	-10	348	336
Licenses.....							28	28
Determinations under sec. 24.....	7	47	54	52	2	+5	538	536
Applications for classification as to power resources.....	3	11	14	13	1	+2	542	541
Applications for agricultural classification.....	41	94	135	² 135			1,578	³ 1,526
Applications for rights-of-way.....	8	102	110	101	9	-1	7,092	7,093
Irrigation project reports.....		3	3	1	2	-2	941	939
Applications under enlarged homestead acts.....	67	56	123	² 123			57,996	³ 57,926
Applications under stock-raising homestead acts.....	1,809	1,442	3,251	² 3,251			143,917	³ 142,040
Applications under ground-water reclamation act.....	2	1	3	3		+2	938	³ 988
Indian Office requests for information.....							9,548	9,548
Unit or cooperative agreements.....		1,454	1,454		1,454	-1,454	1,454	
Total.....	2,682	10,616	13,298	⁴ 11,434	1,864	-1,099		

¹ The terms "gain" and "loss" signify, respectively, decrease and increase in the number of cases pending.

² See footnote 4.

³ These figures as of Mar. 11, 1935.

⁴ Includes 1,999 cases transferred to Grazing Division Mar. 31, 1935, as follows: Agricultural classification, 52; enlarged homestead, 70; stock-raising homestead, 1,877.

Summary of outstanding mineral withdrawals and classifications, June 30, 1935, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	Withdrawn	Classified as coal land	Withdrawn	Classified as oil land	Withdrawn	Classified as oil-shale land	Withdrawn	Classified as phosphate land	
Alaska.....		56,993							
Arizona.....	139,415								
Arkansas.....		61,160							
California.....	17,603	8,720	1,178,392						90,324
Colorado.....	4,142,233	3,082,272	215,370		1,172,778	952,239			
Florida.....							66,796	120	
Idaho.....	11,520	4,603					276,239	270,036	
Louisiana.....			466,990	4,233					
Montana.....	6,259,193	9,373,884	1,336,697	67,651			280,089	3,833	
Nevada.....	83,673								39,422
New Mexico.....	4,124,578	984,829							9,282,160
North Dakota.....	5,954,364	11,178,286	84,894						
Oregon.....	4,361	18,887							
South Dakota.....		250,093							
Utah.....	3,404,043	1,267,697	1,344,473		2,737,274	2,703,755	277,344	2,937	
Washington.....	691,801	141,444							
Wyoming.....	2,143,991	6,847,235	541,777		2,079,897	425,214	989,133	25,293	
Total.....	26,976,775	33,276,103	5,168,593	71,884	5,989,949	4,081,208	1,889,601	302,219	9,411,906

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).

² Includes 13,578 acres withdrawn as helium reserve.

³ Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

Mineral production from public lands and revenues accrued therefrom, fiscal year 1935

State	Petroleum (barrels)	Natural gas (thou- sand cubic feet)	Natural- gas gasoline (gallons)	Coal (short tons)	Potas- sium (short tons)	Sodium (short tons)	Phos- phate (short tons)	Accrued revenue
Alaska.....				97,107.00				\$11,192.40
Alabama.....				26.00				2,267,439.94
California.....	14,239,308	44,717,415	69,136,666	361,530.90		52,288.38		124,938.64
Colorado.....	939,102	1,908,204	39,895	1,847.84			38,184.03	4,235.32
Idaho.....								6,027.38
Louisiana.....	2,543	1,431,639	27,955					83,450.38
Montana.....	341,071	2,704,612		304,992.67				480.00
Nevada.....								297,108.96
New Mexico.....	3,460,294	9,933,463	766,640	39,020.55	334,367.41	3,018.67		24,172.53
North Dakota.....				396,226.07				29,520.19
Oklahoma.....	227,434		480,165					219.25
Oregon.....				77.00				451.04
South Dakota.....				2,245.12				125,123.03
Utah.....	918	37,673	2,668	1,054,165.31				2,599.50
Washington.....				25,964.97				1,405,240.12
Wyoming.....	9,059,044	12,300,319	27,410,277	1,040,817.45				
Total.....	28,269,714	73,033,325	97,864,356		334,367.41	55,307.05	38,184.03	
1934.....	25,055,175	57,866,857	87,728,595	2,691,686.54	294,155.89	46,047.27	43,066.91	3,975,506.91

GEOLOGICAL SURVEY

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	Funds available			Obligations			Balance	
	Amounts ap- propriated or transferred	Repayments on account of work performed		Total	Disburse- ments	Outstand- ing liabili- ties		Total
		Made	To be made					
APPROPRIATIONS								
Salaries.....	\$115,324.00	\$483.11		\$115,807.11	\$115,137.33		\$115,137.33	
Topographic surveys.....	1 164,908.00	214,212.22	\$62,483.24	441,603.46	400,797.52	\$38,319.18	439,116.70	
Geologic surveys.....	307,220.00	25,113.86	6,060.46	338,394.32	318,429.81	6,099.83	324,529.64	
Volcanologic surveys.....	6,391.00	133.43	37	6,524.80	6,523.80	1.00	6,524.80	
Alaskan mineral resources.....	29,092.00	1,599.18	34.52	30,725.70	16,801.33	10,358.79	27,160.12	
Gaging streams.....	2 616,233.54	323,094.34	119,099.35	969,027.23	910,307.24	26,604.54	937,311.78	
Classification of lands.....	108,112.00	10,381.12	1,474.34	119,967.46	110,316.81	7,616.63	117,932.44	
Printing and binding.....	3 104,800.00	3.74		104,803.74	8,963.01	95,963.01	104,803.74	
Preparation of illustrations.....	16,035.00	1,657.01		17,692.01	17,587.93	44.06	17,631.99	
Geologic and topographic maps.....	79,113.00	154,498.51	33,979.85	267,591.36	256,564.78	10,061.84	266,626.62	
Mineral leasing.....	183,910.00	32,633.26	2,285.99	218,829.25	206,982.29	10,428.29	217,410.58	
	4 1,631,138.54	763,809.78	226,018.12	2,620,966.44	2,398,688.57	205,497.17	2,574,185.74	
TRANSFERS								
Construction, irrigation system, Wapato project, Wash., act Feb. 14, 1920 (special fund) (act Mar. 2, 1934).....	550.00			550.00	277.75	237.25	515.00	
Irrigation, Indian reservations (reimbursable) (act Mar. 2, 1934), 1935.....	250.00			250.00	150.29	35.00	185.29	
Maintenance and improvement of existing river and harbor works (War Department, act Feb. 17, 1933).....	6 1,467.97	40.49		1,508.46	1,022.19	486.27	1,508.46	
Maintenance and operation, San Carlos project, Gila River Reser- vation, Ariz. (reimbursable) (act Mar. 2, 1934), 1935.....	2,750.00			2,750.00	2,443.03	281.19	2,724.22	
National industrial recovery, Interior, Geological Survey, 1933-37.....	7 2,961,974.36	32,764.38	48,888.23	3,043,626.97	2,684,463.20	101,311.01	2,785,774.21	
Operating and care of canals and other works of navigation (War Department, act Feb. 17, 1933).....	8 386.77			386.77	335.75	49.20	384.95	
							1.82	

1 Includes \$30,000 of 1934 balance continued available for expenditure during the fiscal year 1935.

2 Includes \$152,092.54 of 1934 balance continued available for expenditure during the fiscal year 1935.

3 Includes \$35,000 of 1934 balance continued available for expenditure during the fiscal year 1935.

4 In addition to these appropriations, there was an allotment of \$5,632 for miscellaneous supplies from the appropriation for contingent expenses of the Interior Department.

5 Includes \$80,036 from indefinite appropriations for salary restorations under acts of Mar. 28, 1934, and Feb. 13, 1935.

6 Balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

7 Includes \$2,296,974.36 balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

Financial statement of United States Geological Survey for the fiscal year ended June 30, 1935—Continued

	Funds available			Obligations			Balance
	Amounts ap- propriated or transferred ^a	Repayments on account of work performed		Disburse- ments	Outstand- ing liabil- ties	Total	
		Made	To be made				
TRANSFERS—continued							
Supervising mining operations on leased Indian lands (act Mar. 2, 1934), 1935.....	\$60,000.00	\$2,949.87	\$1,889.84	\$62,684.23	\$2,051.30	\$64,735.53	\$104.18
Waterways treaty, United States and Great Britain (State Depart- ment, act Apr. 7, 1934), 1935.....	49,600.00	-----	-----	37,867.55	9,890.95	47,758.50	1,841.50
Working fund, Department of the Interior (Army Engineers, for stream gaging).....	24,180.00	540.35	196.26	21,361.41	1,442.05	22,803.46	2,113.15
Working fund, Department of the Interior (Army Engineers, for topographic mapping).....	32,000.00	68.60	-----	19,799.32	138.61	19,937.93	12,130.67
Working fund, Department of the Interior (Federal Power Com- mission).....	600.00	-----	-----	182.92	-----	182.92	417.08
Working fund, Department of the Interior (General Land Office).....	4,225.00	-----	-----	3,362.10	862.90	4,225.00	-----
Working fund, Department of the Interior (Navy Department, operation and conservation of naval petroleum reserves).....	37,921.00	5,475.21	2,129.85	44,775.22	750.84	45,526.06	-----
Working fund, Department of the Interior, Public Works (Agri- culture, Public Roads).....	642,877.24	205.99	-----	35,528.10	-----	35,528.10	7,555.13
Working fund, Department of the Interior, Public Works (Agricul- ture, Weather Bureau).....	872,686.47	5,449.21	475.62	77,460.60	411.93	77,872.53	738.77
Working fund, Department of the Interior, Public Works (Army Engineers).....	935,020.23	864.74	43.07	14,631.34	825.90	15,457.24	20,470.80
Working fund, Department of the Interior, Public Works (Missis- sippi Valley Committee).....	10 17,913.62	1,285.30	-----	19,197.71	.71	19,198.42	.50
Working fund, Department of the Interior, Public Works (Bureau of Reclamation).....	6 893.87	710.44	46.52	1,650.83	-----	1,650.83	-----
Working fund, Department of the Interior, (Tennessee Valley Au- thority).....	11 103,547.22	12,373.14	86.76	114,602.99	1,126.98	115,729.97	277.15
Working fund, Department of the Interior, Public Works (advance for water-resources branch supplies and materials).....	6 1,590.00	106.55	-----	1,696.55	-----	1,696.55	-----
Working fund, Interior, Geological Survey (Agriculture, Soil Erosion, P. W. A.).....	4,100.00	-----	-----	1,403.72	1,652.30	3,056.02	1,043.28
Working fund, Interior, Geological Survey (Agriculture, Weather Bureau, N. I. R.).....	12,815.00	-----	181.03	12,814.35	105.54	12,919.89	76.14
Working fund, Interior, Geological Survey (Indians).....	600.00	-----	-----	600.00	-----	600.00	-----
Working fund, Interior, Geological Survey (Navy, naval petroleum reserves).....	1,435.00	-----	-----	-----	1,435.00	1,435.00	-----
Working fund, Interior, Geological Survey (Public Works Adminis- tration, N. I. R.) (National Resources Board, water resources).....	17,000.00 ^b	-----	-----	14,086.49	8.75	14,095.24	2,904.76

Working fund, Interior, Geological Survey (Reclamation, N. I. R.)-- Working fund, Interior, Geological Survey (Tennessee Valley Au- thority, N. I. R.)-- Working fund, Interior, Geological Survey, Topographic mapping (Tennessee Valley Authority, N. I. R.)-- Working fund, Interior, Geological Survey (War, Rivers and Harbors)-- Working fund, Interior, Geological Survey (War, Rivers and Harbors, N. I. R.)-- Transfer total-- Grand total--	5,003.00	.70	17.50	19,603.71	15,555.85	3,611.12	19,166.97	436.74
	19,585.51			175,136.60	167,426.66	7,709.94	175,136.60	
	175,000.00		136.60	8,992.30	3,715.69	2,652.63	6,268.32	2,623.98
	8,980.00	4.85	7.45	1,916.20	1,730.49	.88	1,731.37	184.83
	1,900.00		16.20	3,813,804.01	3,362,528.56	137,678.25	3,499,606.81	314,197.20
	3,696,849.26	62,839.82	54,114.93	6,434,770.45	5,731,217.13	342,575.42	6,073,792.55	360,977.90
	5,327,987.80	826,649.60	280,133.05					

⁸ Balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

⁹ Includes \$22,536.47 balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

¹⁰ Includes \$2,620.23 balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

¹¹ Includes \$1,913.62 balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

¹² Includes \$3,547.22 balance unobligated on June 30, 1934, and continued available for expenditure during the fiscal year 1935.

*Classification of obligations incurred by the United States Geological Survey
during the fiscal year ended June 30, 1935*

	Salaries	Topographic surveys	Geologic surveys	Volcano- logic surveys	Alaskan mineral resources	Gaging streams
Salaries of permanent employees.	\$115, 137. 33	\$596, 402. 99	\$289, 421. 68	\$6, 403. 03	\$26, 359. 68	\$028, 144. 6
Wages of temporary employees.		1, 062, 025. 83	161, 792. 81	11. 00	16, 443. 35	294, 643. 9
Supplies and materials.		29, 421. 18	7, 214. 68	7. 36	2, 258. 39	35, 218. 1
Dead storage of passenger-carrying vehicles.		16. 23				8. 0
Other storage and pasturage of animals.		2, 921. 55	264. 65		199. 86	641. 3
Communication services.		1, 841. 13	325. 63	3. 63	44. 44	4, 822. 9
Travel expenses.		230, 776. 31	38, 691. 31	22. 12	13, 611. 54	113, 097. 3
Hire, maintenance, repair, and operation of passenger-carrying vehicles.		240. 09	1, 715. 43	75. 22		15, 274. 3
Transportation of things.		9, 856. 35	1, 232. 15		3, 945. 78	12, 054. 5
Hire, maintenance, repair, and operation of freight-carrying vehicles.		98, 902. 72	7, 724. 27		20. 00	25, 456. 6
Printing and binding.		136, 479. 01	3, 373. 51	1. 44	237. 58	5, 265. 1
Furnishing of heat, light, power, water, and electricity.			35. 00		31. 48	174. 8
Rents.		470. 23	614. 09	1. 00		4, 744. 71
Repairs and alterations.		9, 525. 29	2, 731. 79		216. 69	81, 151. 44
Special and miscellaneous current expenses.		235. 32	228. 90		48. 70	130. 71
Purchase of passenger-carrying vehicles.		545. 75	1, 071. 00			10, 261. 30
Purchase of freight-carrying vehicles.		34, 143. 68				15, 137. 74
Purchase of scientific instruments and parts.		31, 420. 66	2, 733. 26		579. 79	70, 952. 81
Other equipment.		22, 087. 03	2, 806. 33		1, 478. 17	8, 057. 96
Structures and parts.						76, 001. 97
Miscellaneous refunds, adjustments, and transfers.		135, 544. 50	11, 009. 67		1, 633. 70	11, 831. 67
Total.	115, 137. 33	2, 402, 855. 85	532, 986. 16	6, 524. 80	67, 109. 15	1, 713, 072. 24

	Classifica- tion of lands	Printing and binding	Prepara- tion of illustra- tions	Geologic and topo- graphic maps	Mineral leasing	Total
Salaries of permanent employees.	\$82, 195. 95		\$16, 839. 90	\$200, 670. 08	\$223, 006. 45	\$2, 484, 581. 71
Wages of temporary employees.	2, 746. 93			348. 53	346, 082. 92	1, 884, 095. 68
Supplies and materials.	660. 19		195. 35	54, 809. 81	6, 741. 02	136, 526. 16
Dead storage of passenger-carrying vehicles.	2. 15				35. 25	61. 63
Other storage and pasturage of animals.					13. 00	4, 040. 40
Communication services.	309. 23			3. 62	2, 913. 31	10, 263. 94
Travel expenses.	10, 859. 04		4. 50	397. 13	32, 475. 98	439, 935. 27
Hire, maintenance, repair, and operation of passenger-carrying vehicles.	3, 148. 52				8, 757. 49	29, 211. 13
Transportation of things.	1, 518. 45			81. 00	3, 863. 76	32, 552. 04
Hire, maintenance, repair, and operation of freight-carrying vehicles.	26. 90				2, 464. 24	134, 594. 74
Printing and binding.	2, 528. 15	\$104, 803. 74	586. 92	4, 599. 01	4, 676. 19	262, 550. 70
Furnishing of heat, light, power, water, and electricity.					4, 223. 95	4, 465. 23
Rents.	67. 77				7, 238. 68	13, 136. 48
Repairs and alterations.	58. 92		5. 32	5, 509. 99	23, 768. 45	122, 967. 89
Special and miscellaneous current expenses.	2. 50			75. 40	290. 78	1, 012. 31
Purchase of passenger-carrying vehicles.	8, 430. 37				9, 756. 23	30, 064. 65
Purchase of freight-carrying vehicles.	1, 350. 00					50, 631. 42
Purchase of scientific instruments and parts.	546. 30			29. 40	742. 36	107, 004. 58
Other equipment.	3, 341. 07			29. 25	4, 538. 50	42, 338. 31
Structures and parts.					1, 463. 20	77, 465. 17
Miscellaneous refunds, adjustments, and transfers.	140. 00			4, 298. 10	41, 835. 47	206, 293. 11
Total.	117, 932. 44	104, 803. 74	17, 631. 99	270, 851. 62	724, 887. 23	6, 073, 792. 55

In addition to the above amounts, there was expended directly by cooperating agencies \$49,242.42 for topographic surveys and \$292,058.32 for stream gaging.

OFFICE OF EDUCATION

(Dr. J. W. STUDEBAKER, Commissioner)

I. GENERAL OUTLOOK IN EDUCATION

1. EDUCATIONAL ADJUSTMENTS

ADMINISTRATIVE CHANGES AND ADAPTATIONS GROWING OUT OF PRESENT CONDITIONS

Conditions resulting from the industrial depression have greatly influenced provisions for public-school finance during the last few years. In spite of the fact that public education has for years been regarded as a function and responsibility of the State government, public-school support has been left largely to local school districts. As a result, even before the present financial difficulties had developed, many school districts were having difficulty to raise sufficient revenue by local taxation to support schools; with assessed valuations greatly reduced and taxes made delinquent by the economic situation the burden could no longer be met.

State legislatures were obliged to give relief. The first step naturally was to reduce general property taxes. This was accomplished in a number of States by lowering the maximum rates which authorities might levy. Of course, without other revenue sources, such restrictions only made conditions for the schools worse. Greater State participation in school support was necessary.

During the past fiscal year legislative action affecting the administration and support of education occurred in many States. Complete reports of 1935 legislative action have not yet been received from all the States, and a few State legislatures were still in session on July 1.

It may be said that beginning with 1933 there has been a marked change in legislative policy with respect to the maintenance of public education. This policy consists in increasing the responsibility of the State for the financial support of public schools. Prior to 1933 and since the founding of statehood in practically all the States both legal and educational theory have regarded education as a State function. However, the idea that the State should assume a sizable or major amount of financial responsibility for the support

of education has been of slow legislative development. It was reserved for the economic depression to give profound impetus and effect to this movement.

Reports at hand indicate that the most outstanding legislative changes in education during the past fiscal year consisted in the extension and development of the policy of placing increased responsibility upon the State for the financial support of education. Recent legislative action for increased responsibility of the State is characterized in a number of States by measures which increased or extended the minimum State-financed educational program. During the past fiscal year legislation was enacted in approximately one-third of the States which in some way resulted in the assumption on the part of the State of increased financial responsibility for education. For example, in 1935 the South Carolina legislature extended its 6-month State-supported school system to 7 months. West Virginia extended its 8-month State-supported system to 9 months. The legislature of Wyoming provided through the distribution of a school equalization fund the necessary financial assistance to enable all school districts to maintain a \$1,000 minimum program. Other States in which legislative action provided for increasing the responsibility of the State for the financial support of public schools are: Arizona, Arkansas, Idaho, Kentucky, Michigan, Minnesota, Montana, New Mexico, Ohio, Oklahoma, Pennsylvania, South Dakota, Texas, and Washington.

The marked tendency of recent years to utilize nonproperty-tax systems for the support of education continued unabated during the fiscal year. For example, during the past year legislation occurred which provides school revenue from income-tax sources in the following States: Idaho, Michigan, Ohio, Pennsylvania, South Dakota, Utah, and Washington. Legislative action in Arkansas, Georgia, Idaho, North Dakota, South Dakota, Utah, Washington, and Wyoming made provisions whereby revenue from sales taxes may be utilized for school purposes; and in Idaho, Michigan, Maryland, New Mexico, Nevada, and Wisconsin certain receipts from licenses or sales taxes on alcoholic drinks were allocated for school purposes.

Increased State responsibility for the financial support of education has often been accompanied by increased State control over State and local school moneys. During the past fiscal year legislation of this character occurred in a number of States. Outstanding examples of this type of legislation occurred in Louisiana and New Mexico. The legislature of Louisiana created a State bond and tax board which stipulated that thereafter no parish or municipality or school district shall have authority to borrow money, incur debt, or issue bonds or to levy taxes without the consent and approval of

the State bond and tax board, and declared that all debts contracted or bonds issued by parishes, municipalities, and school boards without the consent of the said State board shall be null and void. Louisiana also prohibited the expenditure of public money or credit by cities and school districts without the regulation, supervision, and approval of the State advisory board. In New Mexico by legislative action the State board of finance was vested with supervision and control of the budget of all State offices, departments, and institutions, including the department of education and institutions of higher learning, subject to review by the Governor. The State board of finance was empowered to adopt standard office supplies and equipment and to regulate purchases. Among other States enacting legislation which effected increased State control over school expenditures are: Colorado, Idaho, Indiana, Minnesota, Louisiana, New Mexico, Ohio, Oklahoma, Pennsylvania, and Washington.

During the year a number of legislative changes occurred designed to promote efficiency and economy with respect to the administrative and supervisory functions of public education. For example, the legislature of Vermont "in the interest of convenience and efficiency" directed the State board of education through the commissioner of education, acting as the executive officer of the board, to combine as soon as possible the several school districts of the State into supervisory unions each approximating 50 teachers, subject to the following exceptions:

I. Towns or cities employing 40 or more teachers shall be allowed to remain as districts.

II. High-school principals shall be relieved of all supervisory responsibility for class work outside of the high school.

The Oregon Legislature prohibited the establishment of a school district with fewer than 20 pupils of school age. In Oklahoma the legislature stipulated that State aid may be withdrawn from any school where the average daily attendance falls below 18, or where the school district fails to meet standards established by the State board of education. Other measures designed to restrict the maintenance of small school districts were enacted in a few other States, among which are: Iowa, Montana, and Nevada.

YOUTH PROBLEMS

The Office of Education has continued its earlier interest in the problems of unemployed out-of-school youth which have continued acute throughout the year. A special committee of staff members was organized in August 1934 to systematize as far as possible the efforts of the Office in this field. The General Education Board has made grants to assist the work of the committee. With these funds

the committee has employed a staff to carry on two studies under the general jurisdiction of the committee. One is a survey of conditions, needs and desires of youth in 60 representative communities, rural and urban. In this survey the committee has the active cooperation of a committee of the American Sociological Society as well as the cooperation of the statistical divisions of the F. E. R. A. and the central statistical board. Voluntary services must be depended upon for leadership in the several communities while relief workers are assigned to carry out the detailed labor.

The other study deals with the activities being carried on throughout the country in the interest of unemployed out-of-school young people. About 13,000 inquiries were sent out to lists of persons most likely to know about these activities. The names of persons actually in charge of the activities were thus secured. These persons were then sent a special inquiry, asking that they describe briefly each activity, how it is sponsored, how many young people participate, and with what success the activity seems to be meeting. These reports are then abstracted and the materials classified as a basis for bulletins in process of preparation, 1 on guidance, 1 on education for out-of-school youth, 1 on leisure-time activities of out-of-school youth, and 1 on the problem of employment among youth. These bulletins will be completed about November 1935.

One other activity of the committee has been a compilation of a handbook for community leaders. The materials for the handbook have been culled out of survey materials and accounts of community activities. The purpose of the handbook is to stimulate and guide communities which desire to improve and better coordinate their services for out-of-school unemployed youth. This bulletin will be ready for publication in August 1935.

A casual examination of the functions of the several Government departments made during the winter of 1933-34 revealed that no Government agency was giving particular attention to the problems peculiar to the generation which was just then coming into the age of employability. About two and one-quarter million young people reach the age of 18 each year. Of these probably a half million continue in some full-time school or college. The remainder are on the labor market.

The point of view which dominated the codes of fair competition with respect to the reemployment of former workers as well as the adoption of minimum wages made industry slow to employ youth. It appeared, therefore, that this rapid accumulation of young people by the addition of millions each year constituted a major problem worthy of governmental consideration.

While the problem was basically one of employment, it was quite clear that a large element in the situation was the need of these young

people to continue in forms of education which better prepared them for the changed social and economic conditions which they were to confront. Many had no adequate vocational training and many others were rapidly losing their employability through disuse of their vocational skill and information. The lack of comprehension of the causes of the depression was a strong factor in their loss of morale. The Office of Education, therefore, took the initiative in calling together, in April 1934, representatives of the various Government agencies which were conducting programs for or gathering information concerning youth. These included the Extension Division of the Department of Agriculture, the Forestry Service, the U. S. R. A., the F. E. R. A., the Census Bureau, the Children's Bureau, and the Employment Service of the Department of Labor. These representatives agreed unanimously upon two matters: First, that the problem was sufficiently acute to warrant governmental interest; second, that the Office of Education might properly assume the initiative in seeking solutions insofar as those solutions came within the sphere of the Federal Government.

Therefore, in addition to the activities of the Committee on Youth Problems the Office has advocated two programs in the interest of unemployed out-of-school youth. These may be characterized as the long-time program and the emergency program.

(a) *The long-time program.*—It is recognized that the problem of unemployment among youth is not likely to disappear with the disappearance of the acute phases of the depression. Therefore, some fundamental changes are likely to be required in the opportunities for guidance, education, and recreation available to young people. Therefore, the Office of Education decided to seek support for the creation within the Office of a permanent Division of Youth. In this effort they have been assisted by many youth groups but notably by the National Student Federation.

The service contemplated by the Division of Youth falls into two categories:

First, an office and field staff in guidance, in recreation, and in education, to assemble information concerning activities for out-of-school youth and to assist communities in setting up the best programs to meet the needs of young people.

Second, the organization in a few representative communities of experimental programs to test out various types of activities. These, of course, would be financed largely by the communities served but would be under the general supervision of the Office of Education.

Budget support for the Division of Youth was not secured for the fiscal year, 1935-36. Pending the decisions as to how to meet the emergency situation confronted by youth it was impossible to secure

favorable action on the request for financial support for the permanent set-up.

(b) *Emergency program.*—During the fall of 1934 efforts were made to secure approval of more comprehensive F. E. R. A. project designed to serve the needs of unemployed youth. The Federal student-aid program was making it possible for approximately 100,000 young people to attend college. C. C. C. camps were caring for approximately 250,000 young men. The apprenticeship committee, under the Secretary of Labor, was making headway with its program of apprenticeship, but its plans were designed to assist only a few thousand young people. Emergency junior colleges, under the F. E. R. A., were being opened in many States. The adult education program, under the F. E. R. A., was enrolling many young people in adult-education classes. In spite of all these efforts, however, the problem was not being met adequately. Therefore, the Office of Education sought to devise a fairly comprehensive program which might be supported from the large work-relief appropriation which was assuredly to be made during the winter months by the Congress.

After much deliberation a proposal was drafted and submitted for criticism on February 11, 1935, to a small group of national leaders in the various aspects of youth activities. After a full day's conference the proposal was endorsed in all of its essentials and became the program actively advocated by the Office of Education. The Commissioner of Education conferred with many Government representatives concerning the proposal, and finally, on April 26 released to the press its outlines in order to obtain the reactions and criticisms of interested persons throughout the country. The proposed program was discussed in radio addresses and on the platform. The response appeared to be not only generous but enthusiastically favorable to the type of program advocated.

The essentials of the proposal were:

1. *Number reached.*—To provide for 2,000,000 young men and women while living at home; about 10 percent of those 16 to 25 years of age.

2. *How administered.*—To be administered by the educational system—Federal, State, and local—just as other educational programs now are.

3. *With what cooperation.*—To be planned and carried out with the cooperation of those agencies and individuals most vitally concerned in National, State, and local community.

4. *Nature of program.*—The community program to consist of—

- A. A guidance and adjustment service.

- B. As varied educational opportunities as possible.

- C. Recreation utilizing all the agencies and facilities available.

D. Part-time employment at socially desirable jobs for those who cannot participate in the program without some financial aid.

5. *Wages*.—To vary according to need, up to maximum of \$20 a month with an average not exceeding \$12 per month per youth.

6. *Basis of allotments*.—Allotment of funds to a community to be based upon numbers of youth living there.

7. *Cost*.—Total Federal funds required if and when all communities have been given their maximum allotments, \$40,000,000 a month.

National Youth Administration.—On June 26 the President promulgated an Executive order setting up the National Youth Administration as the Government's solution of the emergency youth problems. While the National Youth Administration differs in essential respects from the proposal advocated by the Office of Education, it is still in process of development and it is too early as yet to state with certainty what its program will ultimately be.

EDUCATIONAL OPPORTUNITIES AT SCHOOL AND COLLEGE AGE

In the report of this Office for last year we were able to say that in communities of 5,000 and fewer inhabitants (those in which there had been most curtailment of educational opportunities) attendance in elementary schools returned, in the second semester, to near normal. This was made possible through financial aid to States from Federal funds. While most children were thus enabled to attend school, the length of term was shortened in a large number of districts. Few, if any, city schools were closed 2 years ago, but here also the number of school days was sometimes reduced. From 1930 to 1932 some districts in 19 States lengthened their school year by from 1 to 10 days, but in 29 States it was shortened by other districts from 1 to 11 days, and for the country as a whole, the average school term was shortened by $1\frac{1}{2}$ days.

In 1931-32, 6 States reported a term in some districts of less than 91 days, with an enrollment of 192,591 children in the schools having this brief term. Six States also reported a year in some schools of 91 to 110 days, with 209,647 children enrolled. In reports received for the year 1933-34, the enrollment in schools with a year of less than 91 days was 107,516, a fall of 44.2 percent, and in those with a term of 91 to 110 days, it was 147,370, or a decrease of nearly 30 percent. These reductions were more than made up for by increase in attendance in schools with a lengthened year. This means that most children of school age were privileged to attend school in 1933-34 and a considerable percentage of them for a longer time than in 1931-32.

By grades the statistics collected for 1933-34 show a decided increase in enrollment in the third and fourth high-school years, while the enrollment in post-graduate classes increased 70.4 percent.

Statistics from 567 colleges and universities on the approved lists of the regional associations, show a total enrollment in November 1934 of 975,218 full-time students, as compared with 907,200 in November 1933, an increase of 7.5 percent. A total of 94,331 students in 1,466 institutions were aided by F. E. R. A. funds, and the increase in enrollment in the selected colleges and universities mentioned above was no doubt due in a large part to this assistance. It has been pointed out, however, by Dr. Raymond Walters in his review of these statistics in the December 15 issue of *School and Society* that there has been an increase in enrollment of 11.3 percent in groups which were not eligible for Federal aid.

EDUCATION FOR UNEMPLOYED ADULTS

Invention and the introduction of new processes, of automatic and semiautomatic machinery, of new materials, and of new products are continuously imposing new requirements upon workers which render their job tenures insecure. The acquired trade skill and experience of the worker may at any time be made of little or no value by the introduction of some new process, or mechanism, or technic.

It is recognized as a factor in the increasing insecurity of workers in their jobs, that applications of science in developing new processes, new materials, new products, new industries, and new technics are being made at an accelerating rate. In the mass such changes are creating a growing demand for occupational-adjustment training as a service organized for adult workers whose acquired trade skills and technics are being continuously and in unpredictable ways devalued by technological advance.

Under these conditions the economic security of workers of all ages depends upon maintenance of occupational adjustment in a work environment which is continuously shifting, and in every field of employment vocational education has been confronted with the problem of helping the adult worker to hold the job he has, or secure a new job.

While maintenance of economic security for employed workers in their shifting work environments has presented problems of increasing difficulty over the past decade, the problems developing immediately in the unemployment situation of the past few years have become even more urgent.

Early in the year requests were sent out from the Office of Education to school superintendents in a selected number of communities, and to State directors of vocational education for reports on services for relief of unemployment being rendered under the cooperative Federal, State, and local programs of vocational education.

A review of activities reported in response to these requests shows that vocational education as organized in our public-school systems

as been functioning extensively for the relief of unemployment in every section of the country.

It has done this by providing special courses for training unemployed workers back into employment, by providing occupational-adjustment training needed to keep employed workers employed, by administering apprenticeship training for unemployed youth, by opening regular vocational courses for enrollment of unemployed adult workers, by finding jobs for unemployed workers and training them for these jobs, by training and employing unemployed workers as teachers of vocational courses for the unemployed, by safeguarding the health, morale, and welfare of the unemployed worker's family during unemployment of the breadwinner of the family, by organizing live-at-home programs for rural families, by occasionally rehabilitating physically disabled unemployed men and women, by cooperating with agencies of public and private relief, rural rehabilitation, and agricultural adjustment.

2. RELATIONS WITH EMERGENCY GOVERNMENTAL AGENCIES

THE CIVILIAN CONSERVATION CORPS

The Handbook for Educational Advisers, prepared by the Office of Education and approved by the Secretary of War January 1934, states the basic philosophy underlying the C. C. C. educational program, and describes the administrative set-up. The Office of Education, acting in an advisory capacity to the War Department, is responsible for the selection and appointment of corps-area and camp educational advisers, and recommends to the Secretary of War the outlines of instruction, teaching procedures, and types of teaching material for use in the camps.

Interest in the camp schools is evidenced by the fact that at the end of June 1935 more than 175,000 enrollees, actually 60 percent of the total enrollment strength, were voluntarily participating in the educational program. Attendance at classes and other activities is entirely voluntary on the part of the men in the camps.

The average number of courses taught per camp is 17. More than half the courses are vocational in nature; 16 percent are on the elementary level; 27 percent are on the high-school level; and 5 percent are college courses. At the end of the public-school term in June, a large number of C. C. C. men were granted eighth-grade and high-school certificates, and diplomas on the basis of credits they had accumulated while attending school in the camps. During the school year about 25,000 enrollees attended nearby night schools. Among the educational activities in the camps are handicraft groups and hobby clubs. According to the June report over 85,000

members were engaged in some form of hobby activity, especially in leather, metal, and wood crafts, dramatics, music, and photography.

The libraries in the camps, consisting originally of 125 books per camp, have been augmented considerably by the efforts of the camp advisers. The circulation of books in the camps now approximates 300,000.

Visual education by means of motion pictures is a widely used educational device. More than 5,000 films are shown in the camps each month.

The broad scope of the educational program is accounted for by the varied training and needs of the enrollees. Although the average years of schooling of C. C. C. students throughout the country is 8.7 years, the educational level differs widely in individual camps. For example, 25 percent of C. C. C. men in the Seventh Corps Area the region just west of the Mississippi, from Minnesota south through Arkansas, are high-school graduates, whereas only 8 percent of the enrollees in the Fourth Corps Area (the Southern States) have completed high school.

Lesson outlines and materials have been prepared to meet more effectively the needs of the enrollees. With the help of the National Park Service, the Forestry Service, and the Soil Erosion Service, a special committee of the Vocational Division of the Office of Education recently prepared a series of new instruction outlines on agriculture, auto repair, carpentry, concrete construction, conservation of natural resources, cooking, masonry, forestry, house wiring, mechanical drawing, photography, radio servicing, soil erosion, and surveying.

In May 1935 Dr. Marsh resigned as educational director, to become associate director of the American Council on Education. Mr. Howard W. Oxley, who had been civilian adviser for education in the Second Corps Area since September 1934, was appointed to succeed Dr. Marsh.

With the issuing of an Executive order by the President, increasing the number of camps to 2,916 and extending the C. C. C. enrollment to 600,000, the educational budget was increased to \$6,000,000. The quota of camp advisers was increased to 2,200, and an assistant camp adviser is to be appointed in each camp.

An assistant director of education in the Washington office and assistant corps-area advisers in the nine regional headquarters have been authorized to assist in the administration of the program. Mr. S. M. Ransopher, formerly the Seventh Corps Area educational adviser, was appointed on June 25, 1935, as assistant director.

Seventy-six district advisers, to be assigned to C. C. C. district offices, will bring the supervisory personnel up to the necessary requirement.

FEDERAL EMERGENCY RELIEF ADMINISTRATION

The request for Federal funds for the purpose of maintaining schools in smaller communities were not so large as last year. This year about 10 million dollars were allotted to 22 States, and in the previous year 32 States were aided to the extent of \$15,123,125. In distributing funds for this purpose the Office of Education was consulted, and members of the staff made visits to Florida, Georgia, New Mexico, North Dakota, and South Dakota to study their programs of school relief.

In the emergency situation education has been recognized as a field within which special relief projects can be extensively organized under the policies of the Relief Administration. Expenditures for such projects are largely for salaries of men and women, eligible for relief or already on relief rolls, who can qualify as teachers of emergency education classes or as agents in school-health service. Such projects in education have included the organization of nursery schools for young children, classes to fit the educational needs of adults, vocational-training classes for unemployed adults in need of such training to make them employable, and the vocational rehabilitation of unemployed physically disabled adults.

The fundamental problem in organizing emergency education programs has been to find, among the unemployed eligible for relief or already on relief rolls, men and women qualified by experience to teach emergency classes, and to provide intensive teacher-training for such men and women in the professional technic of teaching. The Office of Education has cooperated in an advisory capacity and through making available the services of experts on its staff, in the organization of these emergency education programs.

SUBSISTENCE HOMESTEADS

There have been many problems relating to public education in connection with the Government's effort to solve a part of the economic maladjustment through the establishment of subsistence homesteads. The organization in charge of these developments has from time to time come to the Office of Education for information and guidance concerning these problems. The information needed has been both general and specific in type. In selecting the sites for such developments it has been found necessary to take careful account of the types and levels of schools available within

the proposed areas themselves, those available in communities adjacent to the proposed developments, and the accessibility of these various types of educational services. It has been one of the tasks of this office to provide information concerning the schools available and the conditions under which they operate.

PUBLIC WORKS ADMINISTRATION

The Office of Education has cooperated during the year with officials of the Public Works Administration in regard to school-building problems throughout the country. Estimates were prepared for the administration of immediate school-building needs and data on the financial condition of school districts were supplied. All State and urban records of school-building equipment and financial status assembled in the Office of Education have been placed at the disposal of the Public Works Administration as a check on the applications the Administration receives for school-building projects.

At the request of the Housing Division the Office has served as a clearing house for the recommendation of local members of national organizations active in the fields of nursery school and day-nursery work to serve local housing-advisory committees. The service has also been desired in determining local needs and permanency for the operation of such educational or supervisory programs for children below school age as might be organized.

CENTRAL STATISTICAL BOARD

In connection with the work of the central statistical board the Chief of the Statistical Division of the Office was assigned to serve on the committee on financial statistics of State and local governments. Members of the staff are consulted from time to time in reference to studies related to education.

II. OFFICE OF EDUCATION

1. RESEARCH AND INVESTIGATION

EDUCATION DURING THE DEPRESSION

Since about 1932 there has been a large demand from various sources for information concerning the effects of the depression on the schools and much time has been spent by the Office in collecting and compiling data to meet these requests.

In order to be certain as to the location and extent of the financial emergency in the public schools we sent, early in the autumn of 1934, inquiry forms to the several State departments of education to ascer-

tain the number of schools, pupils, and teachers that would be affected because of insufficient funds to operate a normal or customary school term.

The replies, which were summarized and published as Circular No. 138, indicated that the emergency in 1934-35 would be as extensive as it was in 1933-34, although in many cases the same schools were not involved. The replies showed that there were 32,139 school districts in 25 States that did not have sufficient funds to operate schools for the number of months in 1934-35 to which they were accustomed and that without additional funds school terms would be shortened by an average of about 3 months in the schools involved. It is too early to show to what extent the emergency was actually met. In some States legislation was enacted to provide more funds for school purposes, but in general the legislation will not be in effect until 1935-36.

Data were also collected regarding the outlook on higher education and published in Pamphlet No. 58, the *Economic Outlook in Higher Education*. It appears from this report that for institutions of higher education as a whole the decrease in income which had prevailed is about at an end. Comparative reports from more than 500 institutions indicated a change from 1933-34 to 1934-35 amounting to less than 1 percent in expected current and capital receipts, in budgeted expenditures for educational and general purposes, in number of staff members, or in their compensation.

SCHOOL ADMINISTRATION PROBLEMS

An outstanding problem which commands the attention of State and local school officials and of lawmakers more persistently today than usual is that of providing economical and satisfactory local school administration and revenue units. Present financial conditions make it imperative to economize in government wherever possible. Obviously one way to economize is to reorganize many of the school districts of the country so that the unit of administration and support may be larger. Larger units would tend to equalize the burden of school support and also to provide better educational opportunities. As it now is thousands of school districts maintain small one-room schools that cannot provide a modern educational program such as is offered in the larger schools of the country. That many of the school districts should be enlarged has been pointed out for years in official State and county school-survey reports. In several of the States educational commissions are studying the problem of local school administration and support, and State legislatures are giving the matter serious consideration.

There is no general agreement as to the best size of local units for administration and support. A type of unit suited to one State

might not be suited to conditions in another State. Each State in which there is apparent need for the reorganization of school districts should make a careful study of the problem. The reorganization of school districts involves several other problems, as the transportation of pupils and the location of school buildings. In order to help State departments of education, and county, city, or district superintendents of schools attack the problem of the reorganization of local school districts the Office has prepared a Handbook of Suggested Procedures for the Reorganization of Local School Units and the Projection of School Building Programs.

The procedures set forth are chiefly applicable to the schools of rural districts, towns, villages, and small cities. The Handbook points out that before school-building programs can be projected plans must be made for the centralization of schools and the reorganization of school districts, and the projection of new school programs. With this principle in view the Handbook shows what data are needed in the planning of school reorganization, how to organize the data, how to project a school-building program in terms of the number of pupils to be accommodated, the educational program to be offered, and the adequacy of the present school buildings, and how to estimate the cost of the projected building program.

A problem in school administration that has received the attention of school administrators for years is that of the enforcement of the compulsory school-attendance laws. In some school districts these laws are loosely enforced owing to the fact that their enforcement is left entirely in the hands of local school officials. In order to answer questions frequently asked regarding certain features of the compulsory-attendance laws in the several States, as to compulsory school age, qualifications of attendance officers, State supervision of attendance enforcement, and other provisions for administering the attendance laws, the Office has prepared Bulletin, 1935, No. 4, Compulsory School Attendance Laws and Their Administration.

Within the past year many requests have come to the Office for information on the extent of expenditures by the Federal Government for education. A study was made primarily to supply such information and was published as Pamphlet No. 45. This pamphlet shows not only the amount of funds the Federal Government usually authorizes for educational purposes but also the amount it expended for emergency educational programs.

Studies in progress relating to the administration and support of education (nearing completion) are State Provisions for Equalizing Educational Costs, and Educational Facilities on Federal Government Reservations.

SCHOOL LEGISLATION

The Office completed and published its biennial review of educational legislation which was enacted by the various State legislatures in 1933-34. This review is designed to show the major legislative changes which affect the administration and maintenance of public education. It includes reviews of legislation affecting new sources of school revenue and many other important phases of education, such as higher educational institutions, curriculum, textbooks, teachers, school attendance, etc.

The Office continued its policy, established in 1933, of issuing circulars on current legislation in the various States affecting education, and two such circulars have already been issued dealing with 1935 legislative activity; a third one is now being completed. These circulars contain summaries of legislation affecting the principal phases of public education.

Other studies completed which pertain to educational legislation are:

(a) Legislation concerning free textbooks (Pamphlet No. 59), which reviews the principal provisions of legislation in the various States relating especially to two major textbook problems, namely, that of providing free textbooks, and the problems of textbook selection and uniformity.

(b) Legislation concerning early childhood education (Pamphlet No. 62)—this is in the nature of a legislative handbook for use of legislators, educational committees on legislation, and other interested citizens.

School legislation studies now in progress include the completion of reviews of outstanding 1935 educational legislation and two legislative handbooks—one on problems of school administration and one relating to school finance.

STATISTICS OF EDUCATION

For many years one of the major functions of the Office has been the collection and dissemination of educational statistics on a national basis for many types of education. A small field force obtains delinquent reports and assists in establishing uniformity in recording and reporting statistical data.

The emergency organizations of the Government have used our data and our services in advisory capacities and in setting up the administrative machinery for giving aid to rural schools. We have shown the effect of the economic situation on the schools in several publications.

In the following tabular statement of the statistical work of the year the capital letter "C" stands for collected and "T" for tabulated; "C-T" means both collected and tabulated in the year.

Subject of study 1934-35	Biennial	Type of study	
		Periodic	Special
State school systems:	C		
Personnel and finances.....			
Preliminary statistics.....			T
Effect of economic situation.....			C-T
County school systems:			
Personnel and finances.....			C
City school systems:	C-T		
Personnel and finances.....			
Per capita costs.....		T	
Higher education:	C-T		
Personnel and finances.....			
Land-grant colleges.....		C-T	
Effect of economic situation.....			C-T
Secondary schools:			
Public:			
Personnel.....		C-T	
Subject enrollment.....		C	
Private:			
Subject enrollment.....		C	
Elementary schools:			
Public:			
Administration, city, county.....			T
Private:			
Personnel.....		T	
Teaching staff, rural salaries.....		C	
Negro education, personnel and finances.....		T	
Guidance, case studies.....			T

ELEMENTARY EDUCATION

Material from the extensive observation and study made last spring of education and welfare work for young children in European countries has been compiled for publication. It will show the national and local responsibilities assumed and methods applied, by those countries for safe-guarding mental and physical health.

For older elementary school pupils emphasis throughout the country has been upon individual guidance of pupils and upon supplementing the school curriculum to meet the varying needs of boys and girls. In this work the Office has assisted teachers or superintendents in several ways. An annotated and classified bibliography of State and city courses of study issued since 1930 has been assembled. A descriptive directory has been made of noncommercial organizations in the fields of science, hygiene, and art which issue bulletins, pictures, and other materials of help to teachers in supplementing the curricula. Individual record and report forms of pupil progress designed for parents in several hundred school systems have been assembled, analyzed, and loaned to supervisors, teachers, and the faculties of teachers colleges in 26 States.

SECONDARY EDUCATION

A publication on research needed in secondary education is in preparation. This takes up the major field developed in the national survey of secondary education, and lists the principal further investigations needed in each of these fields. When completed the work will present for investigation a suggestive list of problems which are both timely and susceptible of solution with data available at the present time or obtainable by established techniques.

COLLEGIATE AND PROFESSIONAL EDUCATION

The division of higher education during the past year continued its study of the question of relationship of the State to higher education. An important contribution to this field was a bulletin published by the office on the supervision exercised by States over privately controlled institutions. This bulletin contained a comprehensive analysis of the laws of the various States and showed the widely different policies adopted by them toward colleges and universities under private control. Another bulletin dealt with the problem of duplication among State-controlled institutions of higher education. In this study were presented the duplications found by certain surveys in five States together with criteria for eliminating duplication and plans for reorganizing State systems of higher education. A third bulletin discussed the relation of the State to privately controlled higher education.

The division has given considerable attention to the question of graduate instruction during the past year. In June the bulletin on Graduate Study in Universities and Colleges came off the press and has had wide distribution.

TEACHER PREPARATION AND PERSONNEL

Old-age security of college staffs became a matter for further investigation, after a survey study by the Office showed that nearly four-fifths of the college staff members in this country were teaching in situations in which they were individually responsible for any retirement provisions made. A study of insurance and annuity plans was therefore initiated during the year, with the purpose of assisting college administrators and others in planning their programs for the benefit of their staffs.

The difficulties involved in raising the levels of teacher education during recent depression years and the dangers of back-sets to former State programs of teacher personnel advancement, resulted in the conduct of a study of teacher certification practices and principles

which is planned to be of assistance to State officers engaged in the formulation and administration of certification requirements.

Selection and preparation for publication of a bibliography of the professional education of teachers, selected from more than 1,800 references published since June 1932, was undertaken as a further extension of a service begun in 1932. At that time, a volume of 1,297 references selected from more than 3,500 on file was published. The new study will bring this volume up to date.

ADULT AND PARENT EDUCATION

The activities of the specialist in the field of adult education have been conducted primarily in connection with the Federal Emergency Relief Administration.

Studies of aspects of parent education and of the movement for the cooperation of the home and school have been made by the specialist in parent education. One of these is with reference to parent education opportunities in the United States. This study covers some of the outstanding programs and many of the current practices in parent education carried on in universities, colleges, State departments of education, public-school parent-teacher organizations, churches, and other institutions and agencies.

The efforts at cooperation between high schools and the home have not been so generally successful as have those of the elementary school and the home. A study of a limited number of high-school parent-teacher associations has been made in order to find out what goes into the making of a good high-school association. The study deals with the objectives, programs, projects, and activities of a selected number of associations for which 118 high-school principals and 123 presidents furnished data. It will be published under the title, "Significant Programs of High-School Parent-Teacher Associations."

In order to furnish leaders in the comparatively new field of parent education and parents with suggestions for use in study groups or for individual reading or study, a series of circulars containing annotated lists of books which would further parent education was prepared and issued during the past year.

EDUCATION OF NATIVE MINORITY GROUPS

Education of native and minority groups on the continent and in our outlying parts is of increasing interest and importance. This is due in part to new developments in civil and social conditions affecting these peoples, such as the establishment of a new division of Territories and island possessions in the Department of the Interior; the establishment of the new Commonwealth in the Philippine Islands,

and the extensive plans of the Federal Government toward economic adjustment in the Virgin Islands. The Office has continued during the year to carry out its purposes of keeping in as close touch as possible with educational conditions and progress among these groups; of maintaining established contacts and services and initiating additional ones as opportunity offers and new demands arise, and of disseminating information concerning prevailing conditions, thereby promoting understandings and appreciations among educators on the continent and in our outlying parts.

Two new studies, in the series which have been under way during the past 2 years on education in each of our outlying parts, were completed and are now being printed. One describes educational conditions and progress since American occupation in the Philippines; the other in Hawaii. Similar studies on education in Alaska, Guam, and the Canal Zone now under way will complete the series.

A supplement to the comprehensive bibliography on education of native and minority groups, published as Bulletin, 1933, No. 12, was completed during the year and is in process of publication.

Assistance to educators concerned with minority groups in continental United States, especially in teaching English to children from foreign-speaking homes and bilingual children in outlying parts, was continued. Bibliographies on different phases of this and allied problems have been prepared during the year, contributing to the informational service maintained.

EDUCATION OF NEGROES

Two studies on the education of Negroes were completed. One is a study of the availability of education to Negroes in rural communities. The purpose of this study is to indicate to what extent educational facilities exist for Negroes in rural communities; to show how accessible the facilities are; and to reveal the amount and quality of the education offered. The data were furnished by 57,530 children from 28 counties of 6 States.

The other work was a statistical report on the education of Negroes. It consists of data on pupils, teachers, and graduates in public and private schools and colleges. The receipts and expenditures of public and private institutions of higher learning are given. Most of the information is for 1932; however, trends are shown in certain data from 1917 to 1932.

The abstract of the proceedings of the National Conference on Fundamental Problems in the Education of Negroes has been prepared and is now in press. This report consists of a digest of committee reports made to the conference, together with abstracts of some of the more important addresses. The complete report of the

conference proceedings is in process of preparation and will be issued soon in a single volume.

We have under way the preparation of a 5-year bibliography (1930-35) on the education of Negroes and related subjects. It will bring together a selected list of annotated references for the purpose of assisting educators, research workers, and students in a study of the subject.

EDUCATION OF EXCEPTIONAL CHILDREN

Work was continued on the Federal Civil Works project, the purpose of which was to determine the types of occupations for which deaf and hard-of-hearing young people can most successfully be trained. Six graduate students of the normal training course at Gallaudet College assisted with the analysis of the data. Partial findings have been published in the *Annals of the Deaf*. The complete report is now in process of preparation. Other activities in this field will be found under the headings Conferences and Cooperative studies.

GUIDANCE AND INDUSTRIAL EDUCATION

As a result of the period of depression competition for employment opportunities has greatly increased, with the consequence that many persons seeking employment in skilled and technical lines of work have been made extremely conscious of the need for specialized training for a specific job. The Office of Education as a result of this situation is constantly receiving requests for information as to schools giving various kinds of trade and technical courses. In order to make available data on private schools that would be useful to persons asking for advice on training opportunities, the Office undertook the collection of information from a comparatively large number of such schools. The assistance of State departments of education was secured in locating and obtaining information concerning many schools.

The report of this study lists, by States, private and endowed institutions and gives a descriptive account of each school, including information on courses offered, tuition fees, length of term, amount of endowment, if any, and faculty. There is a short list of industrial companies giving apprenticeship courses included in this report. As a few States require the licensing of private schools, a list of such schools by States is also included. The manuscript of this bulletin, private and proprietary and endowed schools giving trade and industrial courses with an appended list of collegiate schools of technology, is now in progress.

The office is receiving many requests for information concerning occupational trends in general, prospective opportunities in specific lines of work, and qualifications demanded of workers in various occupations. To meet these demands a continuous effort is made to collect information, both from primary and secondary sources, that bears upon these questions. At the present time a considerable amount of material has been brought together that is valuable for answering correspondence. Some information on these questions has also been compiled in a form that can be made available for general distribution to guidance departments in school systems and to individuals teaching classes in occupational information or rendering vocational counseling services.

EDUCATIONAL MEASUREMENT

In line with current changes in interest in tests and measurement, the work in this field definitely includes the encouragement of other methods of appraising school programs than that circumscribed by the new-type test. Samples of other means of measurement are being collected and studied. In line with the growing interest in cumulative records and new-type report cards samples were obtained from a large number of cities. These samples have been bound into sample or exhibit books for use by school systems. These record and report cards were also used in making a study of recent methods used in pupil advancement in the elementary school. This study covering a wide field, is progressing satisfactorily.

A study of the leaving examinations in rural elementary schools has been made. The use of these examinations, begun many decades ago, continues throughout the country. This study brings together data on the existing practices found and makes suggestions for changes.

The study—Prediction of Success in College, a handbook for administrators and investigators concerned with the problems of college admittance or guidance of college students—was issued during the year.

A study of methods of appraisal in home economics, in cooperation with the home economics division of the Vocational Division of the Office of Education, has been authorized and begun.

SCHOOL HYGIENE AND PHYSICAL EDUCATION

The study concerning the carriage of the child, as influenced by school life and other conditions, which has been in progress for some 5 years, was completed.

A list of institutions which prepare teachers of physical education and health education was prepared and published and information

as to the present output of teachers in these fields was collected for the first time. In this connection, the present State requirements of such teachers were collected and published.

The importance of preparing elementary teachers for the various phases of health work in schools cannot be overestimated. A few, but only a few, of our training schools are doing adequate work along this line. By inquiry and visitation we have collected material concerning means and methods found most effective in such training. This project is nearing completion.

Next to the teacher the janitor is the most important agent in school work but he usually receives scant preparation for his work and inadequate direction after employment. The employment, training, and supervision of janitors have not been investigated for some time and such a study was begun this year.

The establishment of a medical and sanitary service in colleges and universities dates back three-quarters of a century, but like most provisions for the health of the student, it exists largely in embryo in many institutions. Its actual state of development has not been investigated for some time and this has just been undertaken. Along with this fundamental feature of welfare work we are also examining the status of instruction in hygiene offered the average student in our colleges and universities.

COMPARATIVE EDUCATION

The associate specialist in foreign education returned from Czechoslovakia and wrote the manuscript for a bulletin on education in that country. The specialist in western European school systems visited the Netherlands and went on to Germany to study education there. Visits were made to five eastern provinces of Canada for the study of administration of schools, secondary education, and the universities.

Throughout the year data on special topics were gathered through the Department of State, the embassies and legations in Washington, Library of Congress, Pan American Union, and by direct and continuous correspondence with education offices abroad.

RADIO AND VISUAL EDUCATION

The Office collaborated in a study of the use of radio by national voluntary organizations which was issued under the title of "Some Public Service Broadcasting by the National Advisory Council on Radio in Education."

At the request of the International Institute of Intellectual Cooperation, the Office collected the opinions of a select group of national leaders on the influence of radio programs. The material thus ob-

tained was analyzed and sent to the institute, which published it in an international report entitled "The Educational Role of Broadcasting." In addition to the studies mentioned, considerable progress was made on the study of the school use of radio, and the leaflet, *Good References on Education by Radio*, was revised.

SCHOOL LIBRARIES

During the year *Aids in Book Selection for Secondary School Libraries* was completed and published as Pamphlet No. 57. *Aids in Book Selection for Elementary Schools*, previously issued as Circular 69, is now being revised and brought up to date. The study of *Promising Library Practices in Elementary Schools* is nearing completion. This consists of descriptive accounts of the best library practices collected from 69 cities of 10,000 population or over. The topics discussed include administration, finance, supervision, organization, housing, book selection, persons in charge of libraries, the library and the curriculum, library instruction, and cultivation of reading.

2. SURVEYS

Public schools of Cincinnati.—One of the major pieces of work of the year was the survey of the public schools of Cincinnati. This survey was made at the request of the Cincinnati Bureau of Governmental Research and the board of education and was done in cooperation with agencies which were studying other forms of public service. The survey was planned and conducted by the assistant commissioner. Many visits had to be made to Cincinnati in connection with the organization and conduct of this work. Ten members of the staff were engaged in the study and since it involved a detailed investigation of all phases of school equipment, personnel, and activity, a large proportion of their time was spent in fieldwork (an aggregate of 265 days) and in conferences. As a consequence much of the usual research of the Office was considerably curtailed.

The report of the survey, which was condensed to some 400 printed pages is in the hands of the publisher at this writing. It contains major recommendations on the subjects of elementary and secondary education, vocational and industrial arts, improvement of instruction, pupil achievement and adjustment, counseling and guidance, health and physical education, pupil accounting, teacher personnel problems, the board of education, organization of the superintendent's office, administration of business affairs, financing the school system, the school plant, and community relations.

Educational survey of 10 counties of the upper Monongahela Valley of West Virginia.—A committee appointed by the President to cooperate with the Upper Monongahela Valley Planning Council under-

took a survey of the social and economic conditions of 10 counties in West Virginia. The committee found it necessary to take into account the educational conditions of the area in question and invited the Office of Education to survey the available facts and to prepare a report. The study concerned itself with two major aspects of the problem. First, it ascertained the type and the amount of education available in each of the 10 counties by an examination of data to show what proportion of the children of various age groups attend school, how long they attend, and to what grade levels they are retained. Second, it undertook to evaluate the quality of education provided through an examination of the annual and permanent expenditures for the various types of educational services and facilities obtaining in these counties.

Oklahoma City.—The work begun last year looking toward the revision of the educational program of the colored high school in Oklahoma City was continued during the current year. The study of the community and school population has practically been completed, and the report, representing the first step in the curriculum revision program, is being prepared. On the basis of the present findings, several tentative courses have been added, and the administration of the school has been reorganized.

Rockland County.—A survey of the schools and the educational activities of Rockland County, N. Y., was undertaken in the spring of 1934. Data have been gathered to show the costs and the type of education purchased under the present school organization of this county and what it would cost to provide an improved program if the present system were reorganized into a smaller number of centralized and enlarged units of school administration. Efforts are at present being made to assist the local school authorities in a program looking toward putting the reorganized system into effect.

National Survey of the Education of Teachers.—The last 4 of the total of 6 volumes constituting the final report of the National Survey of the Education of Teachers were published in June 1935.

3. CONFERENCES

Curriculum construction for retarded children.—A group of 13 specialists from various parts of the country were brought together for the purpose of developing a handbook or guide for the construction of a curriculum for mentally retarded children. It is expected that the publication resulting from this cooperative project will prove of value to teachers, supervisors, and administrators. The manuscript is now being prepared for press.

Coordination of effort for exceptional children.—Following out one of the major recommendations of the White House Conference

of 1930, the Office of Education called together a group of 15 representatives of State and national agencies to consider the possibilities of effecting closer coordination of services for all types of exceptional children on the part of governmental and nongovernmental bodies devoted to their educational welfare. The proceedings of this conference are now in press.

Reorganization of administrative units.—In recognition of the critical situation which prevails in the majority of States in the administration and financing of schools under depression conditions and of the apparent impossibility of a satisfactory solution except through fundamental reorganization of administrative units, a meeting was called to consider the most critical of the problems involved and to report ways and means which seemed to offer a solution. The conference was made up of practical administrators from State departments of education, including State chief school officers and their assistants; members of staffs of research organizations in higher institutions of learning and departments of education, representing as far as possible different geographic sections and different prevailing conditions in population and administrative organizations.

The conference prepared reports which will be published by the Office for the guidance of legislative committees, school administrators, and others most concerned.

Industrial arts.—The growing interest in industrial arts work as a fundamental in a public-school program, together with the manifested need for studying and evaluating the kind of curriculum that should be included in that subject, led the Office to call a 3-day conference on the industrial arts. The personnel of the conference, which was selected with a view to having national representation, included members of State departments of education, city school systems, and teacher-training institutions.

The conference was divided into six groups, each assigned to prepare an outline on a particular phase of industrial arts education. Outlines for the different sections were approved by the conference and assignments were made to the members for further development and later report. These reports are now in preparation and will result in a unit study of this phase of education.

State school systems statistics.—In February 1934 a committee of directors of research in State departments of education was asked to prepare a check list of items to be included in statistics furnished by State school systems and another committee on definitions of these items. The resulting list and definitions prepared by these committees were then referred to each State department of education for consideration. In July a group of State directors of re-

search was brought together for a study of all the reports from State departments on these check lists. This conference recommended a set of items and their definitions for purposes of reporting the statistics of State school systems to this Office. A report of the recommendations of this conference will be issued as a guide to improvement of State and Federal educational statistics.

Comparative education.—A conference of a small group of professors of comparative education was held to discuss the advisability of forming an organization of teachers of comparative education and the place which courses in the subject of education in other countries should have in teacher-training programs. Bases for the discussions were formed in part from the replies to a questionnaire sent to colleges and universities.

4. COOPERATIVE STUDIES

Besides the cooperative undertakings mentioned under the heading of "Conferences", a project on the education of mentally retarded children is being carried on with the public-school system of Minneapolis; with the Society for the Promotion of Engineering Education we have been conducting a survey of graduate work in that field; with the National Association for Nursery Education we prepared a bibliography of nursery-school education; with the National Committee on Music in Education we conducted an investigation of the preparation of music teachers.

5. COLLECTION OF UNPUBLISHED RECENT RESEARCH

Work in the collection of unpublished research material has progressed satisfactorily during the year. The collection of theses now numbers 1,796 received from 64 institutions. These are in constant demand either in the library where they are used by specialists in the Office of Education and students of the local universities, or in libraries of the various universities over the country where they are sent on interlibrary loan.

During the year a pamphlet listing the doctors' dissertations in our collection and available for loan was issued. Demands for loans have increased markedly since the publication of this pamphlet.

Another service which the library renders in connection with this collection is the preparation of appropriate typewritten lists of the most recent theses on various subjects for reply to requests from students and research workers.

There is also on file the research completed by city school systems, State departments of education, and State educational associations, and listed in the annual bibliographies. These studies are available for interlibrary loan.

6. OTHER EDUCATIONAL SERVICE

COOPERATION WITH PROFESSIONAL AND PUBLIC SERVICE GROUPS

In addition to work with governmental agencies and professional organizations mentioned under other headings, we have cooperated more or less in the work of other groups. Among these were:

Division of Territories and Island Possessions, Department of the Interior.
 Bureau of Economic Research, Department of Commerce.
 Committee on Juvenile Delinquency, Department of Justice.
 National Education Association.
 National Congress of Parents and Teachers.
 Progressive Education Association.
 National Council of Parent Education.
 Committee of Twenty-one on Secondary School Standards and Accrediting Procedures.
 Committee on Research in Secondary Schools.
 Junior College Association.
 Association of Deans of Men.
 Association of Land-Grant Colleges and Universities.
 American Vocational Association.
 National Vocational Guidance Association.
 Vocational Research Bureau.
 Child Study Association of America.
 Cooperative Studies, Inc.
 American Association of University Women.
 National Association for Nursery Education.
 National Federation of Day Nurseries.
 National Association of Teachers in Colored Schools.
 Health Section of the League of Nations.
 Gorgas Memorial Institute.
 American Child Health Association.
 National Safety Council.
 American Association of School Physicians.
 Boy Scouts of America.
 National Committee on Inter-American Intellectual Cooperation.
 National Library Association.
 National Advisory Council on Radio in Education.
 Board of Public Welfare of the Division of Emergency Relief of the District of Columbia.

Translations of some 17,000 words in 10 languages were made for the Alien Property Custodian, the Departments of Justice and of State, the Veterans' Administration, and the National Industrial Recovery Administration.

CONSULTATIVE AND ADVISORY SERVICE

No line can be drawn between cooperative work and that which may be called advisory or consultative. Under the present heading, however, we may record the advisory and informational service

rendered to national and State organizations, including many not previously named; to legislators, school administrators, teachers, students, parents, and others. Many persons seek this service in person and there is a host of requests by mail for specific data not covered in our publications and for assistance in studies in every field of educational interest. The advisory and informational correspondence of the Office consumes roughly one-fourth of the time of the professional and clerical staff.

ARTICLES AND ADDRESSES

Over a hundred articles were prepared for periodicals and year-books, and 183 addresses were made before National, State, regional, and local groups.

EVALUATION OF FOREIGN CREDENTIALS AND ASSISTANCE RENDERED ABROAD

At the request of college and university registrars and committees of admission, the Office handled 578 requests for credential evaluation, with 1,354 separate documents in 26 different languages. There was an increase of 74 cases or 14.7 percent over the previous year. The credentials came from 63 different countries. For one or another reason, 118 cases were reviewed. In connection with credential evaluation, studies were made of technical education and nautical institutes in Italy, and in regard to the evaluation of records from Canada.

The Office aided in arranging for official representation at the following listed international meetings: Second Inter-American Conference on Education, Santiago, Chile; International Folk Dance Festival, London; Fourth International Conference on Public Instruction, Geneva, Switzerland; Fifth International Congress on Family Education, Brussels, Belgium; Seventh International Congress of Design and Applied Arts, Brussels, Belgium; and the World Federation of Education Associations, Oxford, England.

We assisted educationists from Australia, British West Indies, England, Brazil, China, and Chile who came to the United States, and wrote many letters of introduction to education officials abroad for school men and women of this country who went to study education in other countries.

LIBRARY SERVICE

The library, which now numbers over 200,000 volumes, was moved in September from its very unsatisfactory quarters. While the present location gives very little room for growth, we have been

able to give better service than we have ever done, and the reading room is crowded much of the time. The books are more readily available, and many problems of administration have been simplified.

The books of the Federal Board have been transferred, and plans for the reorganization of the combined libraries are under way. The librarian of the Federal Board, who has joined the staff of the main library, devotes a large part of her time to research service for vocational specialists.

As usual, a large part of the correspondence has had to do with requests for bibliographies or publications on special subjects. Whenever the subject in question was educational, a list of books has been prepared if no bibliography was available. Fifteen "good reference" bibliographies were prepared during the year.

At the time of the removal of the library from the Interior Building, a considerable number of duplicates were sent to the Alaskan schools, and some also to Howard University and Wilson Teachers College. Duplicates sent to other institutions not only serve the users of those institutions but relieve the pressure on this library.

FIELD WORK

Beside the work away from the Office entailed by the surveys and for the periodic collection of statistics from school systems, which was made this year, a member of the staff assisted the State of Alabama in setting up a new system of records and reports.

PUBLICATION SERVICE

Publications.—Thirty-five bulletins, 7 pamphlets, 1 leaflet, 12 bibliographies, 6 miscellaneous publications, and 10 issues of *School Life* made up the 71 printed publications issued by the Office during the fiscal year. Details of this work are furnished in the following table:

I. PREPARATION

Manuscripts read and edited for—	Number	Number of pages
1. Printing	49	¹ 4, 279
2. School Life (10 issues)	² 280	1, 400
3. Mimeographing and multigraphing	672	
4. Rotaprint	4	32
Indexes prepared	5	1, 479
Charts and graphs	264	
Galleys of proof read		2, 948
Pages of proof read		6, 306
News releases	46	92
Radio transcripts for broadcasting	57	828

¹ In addition, 6,042 bibliographical entries were read and edited.

² Estimated number of articles.

II. DISSEMINATION³

	Number of copies
Bulletins, pamphlets, leaflets, bibliographies.....	349, 000
Circulars (mimeographed).....	28, 050
School Life (10 issues).....	121, 510
Free.....	16, 670
Subscriptions.....	104, 840
Reprints from School Life, extra editions and index.....	26, 550
Circular letters, general information, notices, and advertisements.....	264, 291
Good reference series (mimeographed).....	3, 500
Reading courses.....	10, 000
Price lists (mimeographed and printed).....	89, 000

Directories.—The Educational Directory for 1935 comprised of the following parts: (a) State and county school officers; (b) city school officers; (c) colleges and universities; and (d) educational associations and directories, was prepared by members of the Editorial Division, as was also a handbook of the Office of Education—Its duties, work, history, and publications. Two widely used directories, “Accredited Secondary Schools”, prepared by the Statistical Division, and “Accredited Higher Institutions”, by the Division of Higher Education, were made available.

Biennial Survey of Education.—Upon completion of the summary and chapters on State school systems and higher institutions, the Biennial Survey of Education 1930–32 was indexed and bound. The survey for 1932–34 is well on its way. One chapter, that on commercial schools, has already been printed, and two others, statistics of private elementary and secondary schools and review of educational legislation, 1933 and 1934, are now in the hands of the printer.

News releases.—Forty-six news releases on educational developments were prepared and sent to newspapers and educational journals.

Exhibits.—Samples of Office of Education publications were sent in answer to numerous requests by various educational organizations for exhibits at their annual meetings. A special exhibit showing the work of the Office was prepared for the California Pacific International Exposition.

School Life.—The official monthly journal of the Office of Education still holds first place for the largest sale of any Government subscription periodical. It has, throughout the year, presented in addition to its regular features new developments in the emergency program of interest to the educational field in general.

Special arrangements were made with 10 leading art schools to supply covers for School Life during the year.

³ Figures for distribution by sale through the Superintendent of Documents are not available at this time.

The United States Press Intelligence Service has supplied clippings on education. Information on school developments thus collected was used on the air, in *School Life*, and for other purposes.

Radio services.—Each week throughout the year a program of important educational information has been prepared and presented over the facilities of the National Broadcasting Co. Interest was manifested in numerous requests for copies and for further information on the subjects of each broadcast.

Motion pictures.—During American education week the Office cooperated with a newsreel company in the preparation of a film suitable for showing in many theaters. The Office of Education's exhibit at Atlantic City received wide-spread notice through picturization in newsreels.

PUBLICATIONS ISSUED OR PREPARED FOR PRINTING DURING THE YEAR

BULLETIN, 1933

- No. 15.¹ Federal cooperation in agricultural extension work, vocational education, and vocational rehabilitation.

BULLETINS, 1934

- No. 15. Prediction of success in college.
 No. 16.² Accredited higher institutions in the United States.
 No. 17.² Accredited secondary schools in the United States.
 No. 18. High school clubs.
 No. 19. Problems of duplication as attacked in certain state surveys.
 No. 20. Graduate study in universities and colleges in the United States.

BULLETINS, 1935

- No. 1. Educational directory, 1935.
 Parts
 I. State and county school officers.
 II. City school officers.
 III. Colleges and universities, including all institutions of higher education.
 IV. Educational associations and directories.
 No. 2. Biennial Survey of Education, 1932-34.
 Chapters
 VI. Statistics of private elementary and secondary schools, 1932-33.
 VII.² Statistics of commercial schools, 1932-33.
 VIII.² A review of educational legislation, 1933 and 1934.
 No. 3. Parent education opportunities.
 No. 4. Compulsory-school-attendance laws and their administration.
 No. 5. Bibliography of research studies in education, 1933-34.

¹ This bulletin appeared in June 1935, but was given a 1933 number to complete the list for that year.

² Prepared for the printer before July 1, 1934, but delivered by the Government Printing Office during the fiscal year July 1, 1934-June 30, 1935.

- No. 6. Fundamentals in the education of Negroes.
- No. 7. Coordination of effort for the education of exceptional children.
- No. 8. Private proprietary and endowed schools giving trade and industrial courses.
- No. 9. Education in the Philippine Islands.
- No. 10. Public education in Hawaii.
- No. 11. Education in Czechoslovakia.
- No. 12. Availability of education to Negroes in rural communities.
- No. 13. Statistics of the education of Negroes.
- No. 14. Federal student-aid program.

BULLETINS, 1936

- No. 1. Educational directory, 1936.
 - Parts
 - II. City school officers.
 - III. Colleges and universities, including all institutions of higher education.
 - IV. Educational associations and directories.

PAMPHLETS

- No. 50.² Public education in the Virgin Islands.
- No. 51.² Educational activities for the young child in the home.
- No. 52.² The cost of going to college.
- No. 53.² Statistics of high schools in larger cities.
- No. 54.² Teachers' problems with exceptional children.
 - IV. Deaf and hard-of-hearing children.
- No. 55.² Teachers' problems with exceptional children.
 - V. Crippled children.
- No. 56.² Teachers' problems with exceptional children.
 - VI. Children of lowered vitality.
- No. 57.² Aids in book selection for secondary-school libraries.
- No. 58. The economic outlook in higher education for 1934-35.
- No. 59. Legislation concerning free textbooks.
- No. 60. Doctors' theses in education.
- No. 61. Per-capita costs in city schools, 1933-34.
- No. 62. Legislation concerning early-childhood education.
- No. 63. Education of native and minority groups: A bibliography, 1932-34.
- No. 64. High-school cooperation with the home.

LEAFLETS

- No. 45. Federal grants for education, 1933-34.

BIBLIOGRAPHIES

- No. 5. Nursery education (revised).
- No. 6. Education by radio (revised).
- No. 14. The school auditorium (revised).
- No. 15. Character education (revised).
- No. 21. Secondary education: Instruction.

² Prepared for the printer before July 1, 1934, but delivered by the Government Printing Office during the fiscal year July 1, 1934-June 30, 1935.

- No. 22. Secondary education: Administration and organization.
- No. 28. Education and social change.
- No. 29. The curriculum and social change.
- No. 30. Discussion groups.
- No. 31. The junior college.
- No. 32. Visual aids in education: Motion pictures.
- No. 41. Teaching music in elementary schools.

MISCELLANEOUS

- School Life, 10 issues and index.
- Handbook of the Office of Education.
- Education price list.
- Circular No. 139, Recent courses of study for elementary and secondary schools.
- The preparation of teachers for small rural schools. (A reprint from Vol. V, Part VII, of Bulletin, 1933, No. 10, National Survey of the Education of Teachers.)
- Office of Education section of the Annual Report of the Secretary of the Interior.

VOCATIONAL EDUCATION BULLETINS

Agricultural Service

- No. 169. Analysis of special jobs in farm forestry.
- No. 177. Emergency programs of vocational agriculture.
- No. 178. Teaching farm credit.
- No. 180. Summaries of studies in agricultural education.

Home Economics Service

- No. 179. Bibliography of studies of the home economics curriculum.
- No. 181. Rooms and equipment for instruction in homemaking.

Trade and Industrial Education

- No. 106. Stone Setting (revised 1935).
- No. 128. Bibliography on foreman improvement (revised 1935).

Vocational Rehabilitation Service

- No. 148. Vocational guidance in rehabilitation (revised 1935).
- No. 161. Organization and administration of a State program of vocational rehabilitation.

7. ADMINISTRATION

Appropriations.—For the fiscal year 1935, Congress appropriated for salaries in the Office of Education, not including those for vocational education and rehabilitation, the sum of \$231,022, an increase of \$15,297 over the amount available for that object for the fiscal year 1934. This increase did not provide for any addition to the staff, but was due entirely to the restoration of salary reductions. For the fiscal year 1936 the amount has been increased to \$251,720, and provides for the addition of a specialist in State school administration and a stenographer.

The other appropriations were \$12,500 for general purposes, including travel expenses and \$40,000 for printing and binding. For 1936 these amounts were increased to \$15,000 and \$46,500, respectively.

Howard University.—Howard University was inspected during the year, as required by law.

A number of changes have taken place in the membership of the board of trustees. Dr. Abraham Flexner, the president of the board, tendered his resignation February 9, 1935. He was succeeded by T. L. Hangate, Auditor, Teachers College, Columbia University. The new members elected to the board are: Dr. Guy W. Coleman, Boston; Mrs. Floyd K. Garrison, Madison, Wis.; C. C. Spaulding, Durham, N. C.

Under the new plan of organization the Liberal Arts College now includes the School of Education and the courses in art and home economics.

The trustees named as the dean of the New Graduate School, Dr. D. O. W. Holmes, formerly dean of the School of Education.

In April the new classroom building known as Douglas Hall was dedicated and handed over by the Government to the trustees of the university.

The chemistry building is rapidly nearing completion, and when completed will relieve the pressure for space in the scientific departments.

The new organ was installed in the college chapel and was dedicated in January.

The total enrollment of the university for the year 1934-35 was 1,907, of whom 999 were men and 908 were women. In 1933-34 the enrollment was 1,626, of whom 939 were men and 687 were women. This indicates an increase of 281 over the past year.

The university conferred degrees and certificates on 246 graduates, distributed as follows: 123, the bachelor's degree in arts, sciences, or music; 35, the master's degree; 2, the doctor's degree in dentistry; 8, the certificate in oral hygiene; 10, the degree of bachelor of laws; 55, the degree of doctor of medicine; 5, the title of pharmaceutical chemist; 2, the degree of bachelor of science in pharmacy; 4, the degree of bachelor of divinity, and 2, the degree of bachelor of theology.

The teaching staff of the university in 1934-35 included a total of 241 members, of whom 134 were full-time and 107 were part-time. These are the equivalent of a full-time staff of 156 $\frac{9}{10}$. The teaching staff for 1933-34 included a total of 237 members, of whom 135 were full-time and 102 were part-time.

Financial statement.—In 1934-35, the total income of Howard University was \$1,743,818.99, including current and capital funds.

The year preceding this amounted to \$1,178,764.80. The income from the Federal Government for 1934-35 was \$1,395,461.12. The total operating expenditures for 1934-35 were \$1,709,992.63.

The total amount spent for capital expenditures in 1934-35 was \$756,606.28, as against \$229,271.55 in 1933-34.

THE LAND-GRANT COLLEGES AND UNIVERSITIES

The land-grant colleges and universities, once known as agricultural and mechanical colleges, were established by authority of the first Morrill Act of 1862, which provided Federal endowment by the sale of grants of land. Each State received by the terms of this act an amount of public land or land scrip equal to 30,000 acres for each Senator and Representative then in Congress. The sale of these lands created an endowment called the 1862 land-grant fund. In 1933-34 the income from this fund was \$1,127,344, derived from interest on the principal of \$23,350,743 and rentals and rights on unsold land appraised at \$13,726,827.

Additional Federal support was provided for these institutions through the second Morrill Act of 1890 and the Nelson amendment of 1907. Since 1911 each State has received \$50,000 annually, including Puerto Rico, Alaska, and Hawaii; the total appropriation now amounts to \$2,550,000 annually. These moneys must be expended either for salaries or facilities for instruction in certain allowed subjects, and generally most of the appropriation is spent for salaries, as it was in 1933-34, when \$2,533,605 was paid out to faculty members.

The new Bankhead-Jones Act, which was signed and became a law at the end of this fiscal year on June 29, 1935, supplements and increases the Morrill-Nelson appropriations beginning with the year 1935-36. By this act there is authorized to be appropriated annually (Public Act No. 182, title II, sec. 22) to the 48 States and the Territory of Hawaii (Alaska and Puerto Rico do not participate) the sum of \$980,000 to be divided equally—\$20,000 each. In addition, the sums of \$500,000 in 1936-37, \$1,000,000 in 1937-38, and \$1,500,000 in 1938-39 and thereafter annually, are authorized to be appropriated, but the division of these funds is on a basis of population, i. e., the ratio that total population of each State and the Territory of Hawaii bears to the total population of all States and the Territory of Hawaii. Provisions of the act of August 30, 1890, as amended and supplemented, apply to the use and payment of these additional funds.

Sixty-nine land-grant institutions are now maintained—52 primarily or exclusively for white students, and 17 for Negro students. There is a land-grant college in every State, Puerto Rico, Alaska, and

Hawaii; Massachusetts provides 2 institutions, and in the 17 Southern States there are 17 Negro land-grant colleges.

Congress has authorized the Secretary of the Interior to supervise the expenditures of the funds mentioned above, and to require annual reports in detail from the treasurers and presidents of the land-grant institutions. This duty has been assigned to a specialist in the Office of Education. A few of the pertinent facts gleaned from the 1933-34 report are:

In the 69 land-grant institutions faculty members number 25,895, of whom 22,572 are employed full time.

Resident-undergraduate students totaled 104,892 men and 49,202 women; graduate students—10,998 men and 4,625 women; freshman students—30,559 men and 14,780 women.

Enrollments in arts and science courses represented a larger proportion and a larger number of students than ever before in these courses—63,811 men and women. In agriculture, 11,469 students, mostly men, represented an increase over the previous year, but a decided loss during the depression years. In engineering, the lowest enrollment in a decade was reported—26,207 students, all men, with the exception of 112 women.

Receipts for educational purposes totaled \$103,124,212, of which the Federal Government contributed \$18,014,174. In addition there was reported \$1,063,092 for noneducational purposes, \$7,057,428 for capital outlays and plant extensions, \$16,127,153 for auxiliary enterprises including student unions, dining halls and athletics, and \$1,513,022 for net increase of permanent funds. The value of buildings was placed at \$275,261,569, grounds at \$60,540,171, and total plant values at \$436,488,174.

III. VOCATIONAL EDUCATION

This report covers the eighteenth year of operation under the Vocational Education Act of 1917, and the fifteenth year of operation under the Vocational Rehabilitation Act of 1920—the two fundamental acts which, having been accepted by the States and Territories, provide the legislative basis of the cooperative Federal-State programs (1) of vocational education in agriculture, trades, and industries, and homemaking, and (2) of vocational rehabilitation and placement in wage-earning employment of persons disabled in industry or otherwise. It covers the second year of administration of these acts by the Office of Education, to which the functions of the Federal Board for Vocational Education, and the personnel of the staff of this board were transferred by Executive order in 1933.

VOCATIONAL ACTS ADMINISTERED BY THE OFFICE OF EDUCATION

The vocational acts administered by the Office of Education under the direction of the Assistant Commissioner for Vocational Education, include the following fundamental acts and acts supplementary thereto:

1. The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)
2. The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.)
3. An act extending the benefits of the vocational education and vocational rehabilitation acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)
4. An act to provide for vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)
5. An act extending the benefits of the vocational education and vocational rehabilitation acts to the Island of Puerto Rico. (Approved Mar. 3, 1931.)
6. An act (George-Ellzey) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1935-37, additional appropriations for vocational education. (Approved May 21, 1934.) This act continued authorizations of additional appropriations upon expiration of the George-Reed act of February 5, 1929, which had authorized additional appropriations for the years 1930-34.
7. An act (Social Security Act) authorizing additional appropriations for 1936 and annually thereafter for cooperation with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled. (Approved Aug. 14, 1935.)

Appropriations of Federal funds for allotment to the States and for service and research to aid the States in developing their vocational and rehabilitation programs are made or authorized by these acts.

COMPOSITION OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION

The Federal Board for Vocational Education, created by the Vocational Education Act of 1917 as the national agency of cooperation with the States in the building up of public vocational training programs of less than college grade, consists of 4 members ex officio—the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the Commissioner of Education; and 3 citizens appointed by the President—1 representative of manufacturing and commercial interests, 1 representative of agricultural interests, and 1 representative of labor.

So composed the Board is representative of educational interests in general, of public and private interests involved in the several broad fields of vocational training, and of employer-employee interests

in such training. Representation of these interests on the Board safeguards vocational education as a development of our publicly supported educational systems, State and local, and as a program for promoting the economic welfare and security of workers in all fields.

By Executive order of June 10, 1933, effective August 10 of that year, the functions of the Board were transferred to the Department of the Interior, and the Board made an advisory board to serve without compensation. Three vacancies were created on the Board by expiration of terms of the appointive members. To fill these vacancies the President on August 14, 1935, submitted to the Senate the following Executive nominations:

A. Lincoln Filene, of Massachusetts, for the unexpired term of 3 years from July 17, 1933, vice Edward T. Franks, term expired (representative of commerce and commercial interests.)

Clarence Poe, of North Carolina, for the unexpired term of 3 years from July 17, 1934, vice W. Harry King, term expired (representative of agricultural interests).

Henry Ohl, of Wisconsin, for the unexpired term of 3 years from July 17, 1935, vice Perry W. Reeves, term expired (representative of labor).

The Senate confirmed these nominations on August 16, 1935.

CONSISTENT DEVELOPMENT OF NATIONAL POLICY

On review of the acts listed above it will be apparent that Congress has consistently developed the policy initiated in 1917 of providing national grants for support and promotion of State and local programs of vocational education and vocational rehabilitation. It extended this policy to include the vocational training and placement of physically disabled persons in 1920; extended the benefits of the vocational education and vocational rehabilitation acts to Hawaii in 1924; authorized appropriation of additional grants to the States and Territories for vocational agriculture and vocational home economics in 1929 (under the George-Reed Act which expired June 30, 1934); provided funds and administration for vocational rehabilitation service in the District of Columbia in 1929; extended the benefits of the vocational education and vocational rehabilitation acts to Puerto Rico in 1931; authorized additional grants to the States and Territories for vocational agriculture, trades and industries, and home economics in 1934 (on expiration of the George-Reed Act); and in an act (the Social Security Act) approved after the close of the last fiscal year, has authorized additional appropriations annually for vocational rehabilitation of the physically disabled.

Section 4 of title V of the Social Security Act authorizing additional appropriations for 1936 and annually thereafter, for "co-

operating with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled", was not included in the security bill as originally introduced, but was inserted by the Ways and Means Committee of the House at the request of the National Rehabilitation Association. Administration of the increased funds provided will develop new demands upon the rehabilitation service of the Office of Education, for service to aid the States in expanding and strengthening their programs.

It may be noted further that during the past year legislation has been pending in Congress for further increasing grants authorized for vocational education.

In this matter of increasing the financial support and expanding the scope of the vocational education and vocation rehabilitation programs, States and local communities have assumed their share of responsibility, and have generally exceeded requirements in their appropriations from year to year of State and local funds for expenditure under State plans jointly with Federal funds.

ACCEPTANCE OF THE VOCATIONAL REHABILITATION ACT BY HAWAII

During the year just ended the General Assembly of the Territory of Hawaii enacted a law accepting the provisions of the National Rehabilitation Act. Although the Territorial appropriation for the current year is not sufficient to match the Federal allotment, it is reported that additional funds will be made available to carry on the program and match the allotment.

ACCEPTANCE OF THE VOCATIONAL EDUCATION ACT BY ALASKA

By an act approved March 14, 1935, the Territory of Alaska accepted the Vocational Education Act of 1917 and acts supplementary thereto, designated the treasurer of the Territory custodian of Federal funds to be allotted to the Territory, designated the Territorial board of education as the agency to have full and complete authority to cooperate with the Federal office, and appropriated \$30,000 for the biennium, 1935-37, and biennially thereafter, for matching Federal funds. The commissioner of education of Alaska came to Washington during the week of April 15, and the vocational staff assisted him in preparing the Territorial plan for vocational education, which was approved by the Territorial board of education, May 14, and by the United States Commissioner of Education, May 17, for the period beginning July 1, 1935, and ending June 30, 1937.

This acceptance of the Federal act, and compliance with all the provisions of the act, entitles Alaska to allotments under authoriza-

tion of the George-Ellzey Act for each of the fiscal years 1935, 1936, and 1937 of \$5,000 for agricultural education, \$5,000 for home-economics education, and \$5,000 for trade and industrial education. On June 26 these amounts were certified for the current fiscal year for payment to the Territory in semiannual installments July 1, 1935, and January 1, 1936.

On May 23, 1935, a bill was introduced in the House (H. R. 8188) extending to Alaska the benefits of the Vocational Education Act of 1917, and of the Vocational Rehabilitation Act of 1920, and authorizing appropriations to Alaska under these acts—those for vocational education being additional to those authorized in the George-Ellzey Act. This bill was pending at the close of the fiscal year.

COOPERATIVE SERVICE TO THE STATES

Service and research to aid the States in building up their vocational programs operated under State plans have continued during the year past, as in other years. As a result of this cooperative Federal, State, and local effort, enrollments under these programs in vocational evening, part-time, and all-day classes have increased from year to year from 164,000 in 1918 to over 1,100,000 youths and adults of all ages in 1931 and in each of the years following. In the period, 1921 to 1934, some 68,000 physically handicapped dependent persons were vocationally rehabilitated and returned to employment, and at the beginning of the last fiscal year over 37,000 physically handicapped persons were on the rolls of the States in process of rehabilitation. Services rendered to the States during the past year, however, in the several fields of vocational education—agricultural, trade and industrial, commercial, and home economics—and in the field of vocational rehabilitation have dealt largely with emergency activities under recovery programs.

These activities have included extensive cooperation with emergency agencies for adult education, for relief of unemployment, for rural rehabilitation, for agricultural adjustment, for vocational training of unemployed workers, for safeguarding the welfare of the home in the case of families on relief, and for organizing nursery school centers to care for children in families where the homemaker is employed outside the home. In connection with these activities assistance has been rendered through advising with school officials and emergency agencies, in planning and adapting vocational courses to meet emergency needs—especially in developing emergency education programs for unemployed adults on relief and women in the homes of these workers.

The demands made upon the Federal staff for service in promoting these emergency recovery programs have developed without any cor-

responding lessening of the demands for services rendered, year in and year out, in promoting the established going programs of vocational education, and have been met without increase in permanent staff of the Office.

In all fields of vocational education regular services to the States have been continued through the year in visits to schools and teacher-training institutions, in individual and group conferences with State and local administrative staffs, in assisting in the development of State and local programs, and in organizing and conducting the regular annual regional conferences of State supervisors and teacher-training staffs on regional problems in the field of vocational education.

During the year a special survey of vocational teacher training was made for the State of Michigan in which the agricultural, trade and industrial, and home economics services of the Office cooperated.

Some specific services rendered in the several fields of vocational education may be briefly noted:

In the field of vocational agriculture.—Members of the Agricultural Education Service of the Office have worked with State supervisors and teacher trainers in setting up definite vocational programs in evening and part-time classes for out-of-school farm youth and adult farmers. The service has cooperated with the Federal Agricultural Adjustment Administration in developing material on agricultural adjustment and financing, and members of the staff have followed up this material in conferences with State supervisors, teacher trainers, and teachers. They have assisted in formulating plans for utilizing the material in all-day, part-time, and evening classes organized to keep farmers informed on new developments. As a result of these efforts instruction of this character has been given to more than 500,000 farmers and farm youth to enable them to manage their farming operations so as to bring them into better adjustment with changing conditions of agricultural production, marketing, and financing.

Early in the fiscal year the Commissioner of Education brought together a number of State supervisors and teacher trainers in agricultural education for a conference under the direction of the Assistant Commissioner for Vocational Education and the Chief of the Agricultural Education Service, with the objective of organizing the full strength of vocational education forces in agriculture in solving the problem of out-of-school farm youth. The response of State workers was immediate. Many local communities have been surveyed to determine the nature and dimensions of the local out-of-school farm youth problem, and many thousands of these youth have been brought together in part-time classes during the year

under regular and special teachers of agriculture to consider their individual problems, and provide training to meet these problems. Individual teachers report services rendered in their respective communities to from 50 to 400 out-of-school youth who have come to them for group instruction and individual assistance. These services have been rendered by teachers who have been carrying their regular full-time teaching loads with crowded schedules. Agents of the Federal staff have followed up and cooperated in promoting this work in the States.

In the field of trade and industrial education.—While the Trade and Industrial Service of the Office has been severely handicapped throughout the year by having one of its special agents assigned to the Federal Emergency Relief Administration, service to the States has been maintained to the greatest possible extent. In view of the reduced personnel some curtailment of the program was necessary, but service to the States was regarded as a matter of first importance, and the principal curtailment has been in the field of studies and investigations, and in the preparation of manuscripts for publication.

During the year special surveys of the need for trade and industrial education were conducted at Tampa, Fla.; in the State of Arizona; and in the city of Portland, Oreg. The Trade and Industrial Education Service cooperated with other services of the Division of Vocational Education in making a special survey of vocational teacher training for the State of Michigan.

In addition to and supplementing the regular work of the regional agents, special field service was rendered in a large number of States. In Virginia a foremanship program was successfully operated at Covington. Instructor training, including demonstrations for instructors and drill masters of fire departments, was conducted at the request of the State departments of education at Concord, N. H., and at Texarkana, Ark.

Special assistance for the improvement of industrial teacher-training programs was given in Massachusetts, New York, Pennsylvania, Tennessee, Minnesota, Texas, Wisconsin, Florida, and a number of other States.

In the field of commercial education.—Cooperative service to the States in the field of commercial education has included: Assisting the State of Wisconsin in maintaining conference classes for men in distributive occupations in some 15 cities, and planning for extension of this service to 32 cities of the State, and for appointing full-time itinerant teachers to conduct classes for small-store executives, salespeople, retail grocers, meat dealers, and others in distributive occupations; assisting the State of Missouri in initiating a program of part-time classes for salespeople employed in stores;

assisting the State of Mississippi in developing a part-time program for men in distributive occupations, especially for retailers and their employees in small towns; assisting the State of Massachusetts in planning the program for a commercial department in a vocational school to be carried out under the supervision of the Commercial Service of the Federal Office, with the intention of aiding other schools of the State in establishing similar classes; assisting the State of New York in developing a commercial education program for adults; and assisting the State of Pennsylvania in directing the revision of commercial curricula, and in the preparation of a handbook on organization and administration of commercial education.

In the field of home economics education.—In response to requests from the States, the staff of the home economics education service has assisted State departments in setting up programs of in-service training for home-economics teachers, in surveying local conditions and revising home-economics curricula to meet these conditions, and in surveying State programs of teacher training.

The service has worked with State officials and teacher trainers in promoting training for girls who have returned to school because of unemployment. In work for these groups emphasis has been given to the study of homemaking responsibilities through which girls and women can sell their services to others for monetary return. Thus the instruction serves two purposes—to prepare for homemaking and to lead to employment.

The service cooperated with the Women's Work Division of the Federal Emergency Relief Administration in the preparation of material for use by that office.

In conference with State staffs recommendations have been formulated for modifications of day-school programs under the George-Ellzey Act, thus making State and Federal funds serve a larger number of girls.

Assistance through regional, State, and local conferences and through preparation of material has been given toward the education of the consumer-buyer.

The staff has participated in conducting conferences of city supervisors in the development of urban home-economics programs.

A national conference of college home-management specialists was called by the Federal service to work on improving the preparation of vocational teachers in the field of home management.

A member of the staff assisted teacher-training institutions through evaluating their programs for graduate studies in the field of home-economics education.

In the field of vocational rehabilitation.—As in preceding years, the Rehabilitation Service has continued to extend to the States

cooperating in vocational rehabilitation such assistance as they needed and requested for the promotion of their work, and the development of more efficient methods of administration and case procedure.

As a part of the general program of assistance to the States, the Federal rehabilitation staff during the past fiscal year made surveys of the rehabilitation programs in three States—Iowa, Georgia, and Illinois. The reports of these surveys covered in an introductory section basic conditions under which the State rehabilitation department must operate in administration of the work—such as transportation facilities, travel barriers, and topography; geographical distribution of population; social conditions; economic conditions; and rehabilitation and related legislation. A second section of the survey report covered organization of the rehabilitation staff, location and number of district offices, office facilities, functions of the staff, qualifications of personnel, functions of the administrative board, and working agreements with other agencies. A third section dealt with the case-work program—including an analysis of cases rehabilitated, of cases closed as not rehabilitated, and of cases on the live roll at the time of the survey.

Detailed reports of these surveys were submitted to the State officers concerned and, subsequent to submission of the reports, conferences were held with the administrative officers and case-work staff of the States, to discuss the findings and to assist the States in such reorganization of their work as would make for more effective service to the handicapped.

A number of States have requested that similar surveys be made during the current fiscal year.

During the past year special services were requested by a number of the States, and the following services were rendered: Assistance in establishing local programs in Florida at Miami, Tampa, and Jacksonville, and in Ohio at Toledo; assistance in the conduct of State staff conferences in New York, New Jersey, Pennsylvania, Michigan, Illinois, Wisconsin, Ohio, California, Georgia, Oklahoma, and Kentucky; assistance in training new staff workers appointed in expansion of programs in a number of States; assistance to States in the development of supplementary programs of rehabilitation carried on through Federal Emergency Relief funds; assistance in the development of cooperative working relations with employment services in a number of the States; assistance in several of the States in planning and carrying on special studies and investigations—such as the taking of a census of the disabled in the State, the taking of a census of industries in the State to determine employment opportunities for the disabled, and studies for developing more effective methods of carrying on the rehabilitation work.

CONTRIBUTION TO RELIEF OF UNEMPLOYMENT

On occasion of approving the George-Ellzey Act authorizing additional appropriations for vocational education for the years 1935, 1936, and 1937, the President expressed the desire that funds made available to the States by the new act be used for the benefit of the unemployed. With exception of a provision in that act that part-time classes for employed workers operating for less than 144 hours per year might receive Federal aid, the requirements for approval of expenditures in the States for trade and industrial education were the same as those governing expenditures from funds granted to the States by the Smith-Hughes Act.

During the past 18 years definite policies have been established, and interpretations of the Smith-Hughes Act have been made to aid the States in the administration of their program. So far as the standards recommended in these policies were discretionary, and based upon interpretations of the Smith-Hughes Act, they have been reexamined to see what modifications might be made to bring them into conformity with the wish of the President. A conference of State officials was called in Washington in June 1934, and certain modified standards, interpretations, and definitions were agreed upon. These temporarily modified standards, after approval by the Commissioner of Education, were made known to the States in Miscellaneous 1715 and 1599. The evidence is conclusive that the modified rulings and interpretations have functioned as they were intended to function during the year, in making it easier for the States (1) to operate special classes for persons who were in need of vocational training to bring themselves up to date in their trades, and (2) to provide short units of training to meet the specific needs of unemployed persons generally.

It may fairly be stated that the entire program of trade and industrial education, carried on cooperatively between the Federal Government and the States, is one social agency for dealing effectively with the unemployment problem. The record shows that a very large percentage of graduates of full-time day-trade schools have been able to secure employment, even during the depression years. Where there has been a pronounced shortage of trained help locally, and where the school has limited its enrollment to persons in line for available employment, the placement record has been practically 100 percent. This type of school has in fact functioned generally to prevent unemployment in a fundamental way, by removing one of the basic causes of unemployment, namely, lack of training qualifying for employment in an available job.

Service to out-of-school groups, also, including adults who need vocational training to build up or maintain their employability, con-

tributes in an important way to solution of the unemployment problem. Many thousands of adults, by taking advantage of opportunities to receive appropriate vocational training, have been able to secure profitable employment during the past year. Adult re-training work has been conspicuously successful.

For home economics education, with its center of interest in the home, unemployment has developed difficult problems. One responsibility assumed by teachers of home economics has been to find out how home conditions were being affected locally by unemployment, and to bring vocational education into the home to meet conditions found, by safeguarding family health and welfare under these conditions. In the emergency situation home economics education has accordingly been developed in courses based upon surveys of individual family needs, and devised to meet these needs. The homemaker has been taught how to conserve and make the most of the meager resources of the family—how to make over old garments, renovate household furnishings, and buy economically.

The Federal staff has advised with State supervisors and school administrators in promoting cooperation with relief agencies. This cooperation has embraced planning courses for adult homemakers from families on relief, and preparing materials for use in such classes. Members of the staff have conducted conferences with teachers on adapting instruction given in regular day-school classes, and in classes organized for adults to meet the needs of unemployed and low-income groups, and of groups on relief. They have conducted conferences, also, on developing instruction to meet the needs of wage-earning girls and women working in homes, and for girls thrown out of employment by minimum age requirements set up under N. R. A. codes. They have prepared material on service jobs in the field of home economics and on consumer education.

In rural communities home economics teachers have cooperated with teachers of vocational agriculture in developing live-at-home programs—budgeting family needs for food, planning and planting home gardens to meet these needs, and preserving surplus fruits, vegetables, and meats for winter consumption.

Among the consequences of unemployment in urban industrial centers has been a back-flow of population into rural areas, a return to the farm of farm youth who had in other years found employment in urban communities, and a closing-up of avenues of employment for such youth in other fields than farming.

Vocational agriculture has functioned in this situation to establish in farming these youth, and urban families which in many instances have had little if any practical experience in farming for the market, or in farming or gardening for home consumption.

In the field of vocational agriculture relief of unemployment during the past year in its larger aspects has meant for the Federal staff, for State administrators and supervisors, and for agricultural teachers generally modification of programs and development of new lines of instruction to promote agricultural adjustment, rural rehabilitation, and subsistence homestead programs.

NEW PROBLEMS OF THE ALL-DAY AND PART-TIME SCHOOL VOCATIONAL PROGRAMS UNDER CHILD-LABOR LAWS

As was noted in the annual report for 1934, the elimination of child labor under State laws and N. R. A. codes fixing minimum ages of employment, and under policies adopted by employers, has created a gap in our educational system between the age of leaving school and the age of entering into regular wage-earning employment, and imposed upon our public-school system new and very large responsibilities.

Youth in the ages of 14 to 16 and 18 years, who are as a matter of public policy or industrial expediency excluded from entrance into regular employment, cannot be abandoned to complete idleness by local communities during the most critical habit-forming and character-forming period of adolescence. It follows that educational opportunities adapted to the needs of these youth must be generally provided to bridge the gap which has opened up between the years of school attendance and those of productive employment.

For several years past vocational programs have been in process of expansion and adaptation to meet the needs of these out-of-school out-of-work youth. In general the all-day and part-time vocational schools have been modifying and developing their programs to meet the needs of older groups—the all-day school to meet the needs of youth in full-time school attendance beyond the age of 14, to the ages of 16 to 18 years, and the part-time school to meet the needs of employed youth in more advanced ages. The problem of providing for the educational needs of these youth is one large phase of our "youth problem."

In this matter of adapting part-time school instruction to meet the needs of older youth, the Office of Education and State vocational staffs have a large responsibility, since one-third of the Federal funds appropriated to the States under the Smith-Hughes and George-Ellzey Acts for trade and industrial education, if used by the States, must be used for part-time schools.

APPRENTICE TRAINING

Apprenticeship was definitely recognized in the Smith-Hughes Act, and the Federal-State cooperative program of vocational education

in the industrial field was planned to meet the need in this country for skilled mechanics. For many years industries in this country had depended largely upon Europe to train their skilled artisans. The few apprentice training programs which were in operation in this country in 1917 amounted to very little except in a few cases, of which those conducted in railroad shops, navy yards, arsenals, and a few of the larger corporations may be cited as samples.

In the effort to extend employment for adult workers under N. R. A. codes opportunity to develop and operate apprentice training programs in industries and trades covered by the codes was for the time being eliminated. When, however, in 1934 it became apparent that there was an actual and prospective shortage of thoroughly trained skilled workers in these fields of employment, the President issued an Executive order which made it possible to organize apprentice training under the codes through granting certain exemptions from wage and hour provisions. The responsibility for carrying out this Executive order was assigned to the Secretary of Labor, and a Federal Committee on Apprentice Training was appointed. This committee consisted of one member and one alternate each from the N. R. A., the Department of Labor, and the Office of Education. Up to the time that the N. R. A. codes were invalidated by a decision of the Supreme Court, 44 State committees had been formed to administer apprentice training, but the number of apprentices actually indentured under the program was very small, except in the State of Wisconsin where the program was merely a continuation of what that State had been doing for many years.

Reports from the States show that throughout the country the promotion of the program of apprentice training is recognized as a major responsibility of State boards for vocational education in developing the cooperative Federal-State programs of vocational education.

As indicative of the status of apprentice training under the Smith-Hughes Act, it may be noted that 1,400 apprentices were in attendance during the past year at the Washburne Continuation and Apprentice School in Chicago; and that in Detroit 450 apprentices were in school 4 to 8 hours per week and at work the balance of the time. By adding to this figure for Detroit the number of cooperative students, a total of 948 is found as the number of young workers actually learning trades under an organized system of vocational training in the public vocational schools of the city and on the job.

Definite arrangements for extending and developing apprenticeship have been made in Massachusetts, New Jersey, New York, Maryland, Pennsylvania, Ohio, Michigan, Minnesota, Indiana, Virginia,

Florida, Mississippi, Texas, Colorado, California, Oregon, and a number of other States.

A survey of apprentice training made in 1931 indicated that there were at that time more than 31,000 apprentices or trade-school students receiving the equivalent of apprentice training. While exact data on the present status of apprenticeship under the Smith-Hughes Act are not available at this time, it is believed that for the country as a whole the number of apprentices is well over 50,000.

The need for systematic development of apprentice-training programs is particularly urgent in the field of commercial education. In our larger cities one-sixth of the young workers between the ages of 18 and 24 years are employed in distributive occupations, and at least 100,000 youth in the country as a whole are serving in the lower-level positions in retail stores. Apprentice training would greatly benefit those youth.

OCCUPATIONAL ADJUSTMENT TRAINING

In its report to the President last January, the Committee on Economic Security noted that "education, training, and vocational guidance are of major importance in obtaining economic security for the individual and the Nation." It declared with special emphasis that "the educational and vocational equipment of individuals is a major factor in their economic security", and added the following statement:

It has become apparent particularly that education cannot be regarded as completed upon leaving school. * * * In a day and age of rapidly changing technics and market demands, many people will find it necessary to make adjustments long after they have first entered industry. Adjustment of our educational content and technic to this situation is a vital need in a long-range program for economic security.

In this sense vocational education, as it has developed under the Vocational Education Act of 1917, is one long-range social program for promoting the economic security of the worker.

It was in recognition of the vital need for adjustment of our educational content and technic to meet the needs of adult workers, that the act of 1917 provided that Federal funds appropriated to the States by the act for vocational education should be available for evening classes organized to give instruction to adult workers, "supplementary to their daily employment." Since such instruction must be supplementary to daily employment it is essentially occupational adjustment instruction.

Enrollments in such classes of all types—agricultural, trade and industrial, and home economics—totaled 370,000 in 1934, and there is no reason to expect that reports to the Office of Education from the States for 1935, when these reports become available, will show

any falling off of enrollments. Rather it is expected that reports for 1935 will show material increases over 1934 in enrollments of adult workers.

The total of 370,000 for 1934 included 140,000 trade and industrial workers, and 100,000 farmers enrolled in evening classes for instruction supplementary to their daily employment—that is to say, for instruction planned with the objective of promoting their economic security by enabling them to make the continuous occupational adjustments required by “rapidly changing technics and market demands.” Finally the total for evening schools includes 129,000 women enrolled for instruction to enable them to safeguard and promote the welfare of the home under the rapidly changing conditions of home life.

By way of promoting occupational adjustment training, the Division of Vocational Education of the Office of Education issued during the past year a bulletin on Vocational Education and Changing Conditions, summarizing in part some results of an inquiry undertaken at the request of the American Vocational Association. In this publication the larger aspects of problems developing for vocational education in all fields out of recent economic and social changes are presented. A second publication dealing with these problems in more technical detail, as they present themselves to officials administering and supervising agricultural, trade and industrial, and home-economics vocational programs in the States and local communities, is in process of preparation. The evidence assembled in this inquiry justifies the conclusion that it is becoming increasingly difficult in the skilled trades for workers to learn the new technics of their trades on the job without expert assistance, and that opportunities for adults to secure systematic occupational adjustment training, where and as they need it to maintain their employability, are more essential today than they have been in any earlier period; that it is becoming increasingly difficult for the farmer to learn the new technics of farming without expert guidance in applying on the farm the results of scientific research in agriculture; and increasingly difficult for the homemaker to learn without such assistance the new technics of homemaking for health protection, child care, selection and preparation of food, and home management.

Workers in trade and industry must learn these new technics or pay the price of shifting to lower occupational levels, and eventually to the level of unemployability. Workers on the farm must learn the new technics of farming or pay the price of shifting to lower levels of economic welfare and even to the level of insolvency; and workers in the home must learn the new technics of homemaking in urban and rural communities or pay the price of shifting to lower levels of welfare in the home affecting all members of the household.

This need for occupational-adjustment training in all fields, which is rapidly becoming more urgent with the accelerating pace of invention and of scientific and technological advance, is being generally recognized in the States. In the State of Texas, for example, during the past year 231 evening trade-extension classes for men employed in one industry alone—the production and refining of petroleum—were operated as a part of the vocational program in 56 cities. These classes enrolled over 4,000 men from 82 different oil companies. In Oakland, Calif., 1,300 adults were enrolled in 18 different trades in one trade school of the city—the Central Trade School. In Massachusetts 3,515 individuals were given vocational training either full time or part time in new classes or departments in addition to 25,000 enrolled in the regular vocational program—all of these enrollees being unemployed and, except for the training provided, more or less unemployable. A class in Diesel-engine operation, maintenance, and repair was operated in Montana for a period of 3 months, with a long waiting list during all of the time of men from all sections of the State who wanted this training to help them keep up to date in their knowledge of internal-combustion engines. These typical instances may serve to illustrate the variety and scope of occupational-adjustment training being provided by the States in the trade and industrial field.

In the field of agriculture the demand for adjustment training has been met in the States by organization of evening classes for adult farmers dealing with problems of production adjustment, marketing, and farm financing. The prime objective of these evening agricultural courses is to promote the economic security of the farmer in the face of shifting market demands.

Home-economics instruction in evening classes organized for adults has been essentially occupational-adjustment training for home workers.

Special reports to the Office of Education during the past year from State directors and local school superintendents indicate that vocational directors, supervisors, teacher trainers, and teachers in every section of the country in all fields of vocational training have been actively promoting, organizing, and conducting classes for adult workers, employed and unemployed, to bring their occupational skills and technical qualifications into line with the changing requirements of industry, commerce, agriculture, and homemaking. As a result many thousands of unemployed workers have been brought back into employment; the job tenure of many thousands of employed workers has been rendered more secure; and the economic welfare of the farmer, and of homes in urban and rural communities has been improved.

COOPERATION WITH OTHER AGENCIES

The vocational education and vocational rehabilitation programs, initiated in 1917 and 1920, respectively, and consistently developed by subsequent legislation are fundamentally cooperative programs—fundamentally programs (1) for cooperating with the States in utilizing established State and local educational agencies for extension of educational service into the fields of vocational training and vocational rehabilitation of the physically disabled; and (2) for cooperating with other services of the Federal Government to aid the States in building up their vocational programs. In the emergency situation of the past few years, and more particularly of the last fiscal year, cooperative activities have embraced those of Federal, State, and local recovery agencies generally.

All vocational services of the Office of Education—agricultural, trade and industrial, home economics, and rehabilitation—have cooperated with the F. E. R. A. in promoting emergency vocational-education and rehabilitation programs for unemployed adults. These services have all cooperated in their respective fields with Federal emergency activities for relief of unemployment. They have cooperated with agencies organized specially to deal with the out-of-school unemployed youth problem in rural and urban communities.

The Agricultural Education Service has cooperated continuously throughout the year with the Agricultural Adjustment Administration in preparing material for teachers on production-adjustment programs and in following up this material with supervisors, teacher trainers, and teachers to insure its effective use in all-day, part-time, and evening classes. In cooperation with the Farm Credit Administration, the Agricultural Education Service has prepared a bulletin on Teaching Farm Credit for use of teachers in giving instruction on agricultural financing. Two specialists in agricultural education were brought to Washington to work with the agricultural staff in the Office in cooperation with the Civilian Conservation Corps educational authorities in developing course outlines for farm boys in C. C. C. camps. Teachers in the field located near these camps and near subsistence homestead communities have assisted the camp or homestead-educational programs. The service has cooperated extensively with soil conservation and rural rehabilitation agencies in providing counsel and assistance to individual rehabilitation clients and in organizing classes to meet the needs of such clients.

The Home Economics Education Service has cooperated with Federal, State, and local agencies, in rural rehabilitation work, in developing live-at-home programs, in organizing, recruiting, and conducting of emergency home-economics classes for adult women, in

establishing preschool centers, in training emergency teachers and parent-education workers, and in preparing and distributing material on consumer education for use of emergency workers in the field of home economics. In addition to these special cooperative activities in the emergency program, members of the home-economics service have served as members and chairmen of important committees of national organizations interested in promoting home welfare, such as the American Home Economics Association, the National Council of Parent Education, the National Congress of Parents and Teachers, the American Vocational Association, and the National Education Association.

The trade and industrial service has participated in many of these activities. Members of the staff have cooperated in the effort making under Federal, State, and local leadership to revive and develop home crafts generally and particularly for families in subsistence homestead communities. They have cooperated with emergency agencies for unemployment relief. As noted in connection with apprentice training, the chief of the Trade and Industrial Education Service has served throughout the year as representative of the Office of Education, together with representatives of the N. R. A. and the Department of Labor, on a committee appointed by the Secretary of Labor, to organize apprentice training under N. R. A. codes.

The Rehabilitation Service has continued during the past year to build up its cooperative relations with other agencies dealing with the disabled and operating in allied fields. Much of this cooperation is required under laws providing workmen's compensation and employment agency services. Under the Social Security Act the need for cooperation with agencies operating in the field of pensions, unemployment insurance, service to crippled children, service to the blind, and public-health activities will be greatly expanded. Funds made available by the F. E. R. A., for the year, for expanding and promoting in the States the service of vocational rehabilitation, amounting approximately to \$840,000, have been administered by the established national and State agencies operating the regular program of vocational rehabilitation under the act of 1920, in close cooperation with the emergency education program of the F. E. R. A. Although these developments tend to complicate the rehabilitation problem, they materially increase its effectiveness.

NEED FOR ADDITIONAL FEDERAL APPROPRIATIONS

During the past year Congress has given consideration to the need for additional appropriations to the States for the promotion of vocational education and vocational rehabilitation of the physically disabled. It has had under consideration bills increasing authoriza-

tions of appropriations in the several fields of vocational education, partly to meet emergency needs and partly to provide for developing the permanent program of vocational education.

It is recognized that the rural areas of the United States are facing an emergency situation, that farmers in every section of the country are confronted with difficult problems of agricultural adjustment, farm financing, production control, shifting markets, and reduced incomes, and that these conditions call for an expanded vocational program in rural areas. Changing conditions on the farm and in urban and rural homes are presenting many new problems for adjustment. The unemployment situation in both urban and rural communities has created an emergency need for expansion of vocational programs in all fields of vocational training to prevent the unemployed from becoming permanently unemployable and dependent on relief measures, and to provide educational facilities for unadjusted out-of-school youth. At the same time it has become apparent that many States and most rural communities are unable to finance the needed expansion of vocational programs for farmers, industrial workers, homemakers, and unemployed youth.

The requirement that Federal funds appropriated to the States for vocational education shall be matched, dollar for dollar, with State or local funds has worked to restrict the development of vocational programs to those communities which were financially able to provide matching funds and to deprive communities unable to provide such funds of the benefits of vocational programs—to deprive, that is to say, communities which in many instances are precisely those in which the need for vocational education facilities is most urgent.

In this situation it has been proposed to provide additional appropriations for vocational education and to make these appropriations available in part over a period of years without matching with State or local funds. Additional appropriations have been proposed also to provide for some of the expanding needs of the permanent vocational program.

The need for additional Federal funds in the field of vocational rehabilitation has been recognized in the Social Security Act, which provides additional appropriations for this service. The States are at present in a position to absorb about \$1,500,000 of Federal aid for vocational rehabilitation. Sessions of the State legislatures which were held during the past winter and spring in many instances increased appropriations for rehabilitation. In a few of the States appropriations were held to what they were for the past biennium. In none of the States were the funds decreased. Following the passage of the Social Security Act, special sessions of the legislature will be held in a number of the States, and on the

basis of past experience in the development of the program it may be assumed that the cooperating States will be in a position to absorb an additional million dollars of Federal money in the next 2 or 3 years. This amount of money, together with the State and local funds will not, however, be adequate to meet the rehabilitation problem. The future development of the rehabilitation program will be largely dependent on the degree to which the Federal Government participates.

For reasons that appealed to the 1914 Commission on National Aid to Vocational Education, the Smith-Hughes Act of 1917 did not provide Federal aid to the States for occupations in the field of commerce as in other vocational fields. The need for more adequate vocational-training programs for those engaged in distributive occupations is becoming urgent. Small-store operators and other commercial workers are now demanding classes in which they and their employees can be taught more efficient methods and practices. According to the Census Reports about one-tenth of the workers between 18 and 24 annually enter distributive occupations without any preparatory or supplementary vocational training. It is now being realized that vocational training in the field of commerce to promote efficient distribution of the products of farms and factories is as essential to the economic welfare of the country as vocational training in other fields.

LEGISLATION IN THE STATES

During the past year, and in provisions for the current year, the States have continued their appropriations in support of vocational-education and vocational-rehabilitation programs. In some instances States and local appropriations, which had been reduced under the pressure for economy have been restored or increased. Alaska accepted the vocational-education act, and submitted its plan for developing a vocational-education program. Hawaii provided for initiation of a program of vocational rehabilitation. Two States, Florida and South Carolina, enacted compensation legislation which will increase the efficacy of rehabilitation work in these States, and, in addition, a number of States enacted legislation, in the fields of social welfare and employment, of material value for the rehabilitation program.

RESEARCH AND PUBLICATIONS

During the year work continued in compilation of the results of the inquiry undertaken at the request of the American Vocational Association on Vocational Education and Changing Conditions. One bulletin (no. 174), summarizing some results of this inquiry has been issued, and provisional copy for a second publication under this

general title, covering modifications required in vocational programs for wage-earning occupations to bring them into line with changing economic and social conditions, has been distributed to State directors with the request that it be reviewed by their supervisory and teacher-training staffs.

A summary of studies in agricultural education which was undertaken jointly by the Agricultural Education Service and the agricultural section of the American Vocational Association was completed during the year, and summaries of 373 studies will be published by the Office as a bulletin of the Agricultural Service. The research specialist in this service is cooperating with a regional group of teachers in the conduct of a study of supervised-farm practice. As an experimental procedure which may be followed at other institutions, this specialist held advisory conferences for a period of 1 week during the year with teachers working on problems in agriculture, at the summer-school session of one institution. A study was in progress of the activities of teachers of agriculture in connection with emergency and certain long-time programs related to agriculture.

In the Trade and Industrial Education Service two studies in the field of vocational training for the aviation industry were initiated, and will be published during the current fiscal year. One of these studies deals with training for sheet-metal workers in the industry. The second, making a general survey of the entire field of aviation and of different types of courses related to the industry, is being prepared for the general reader rather than those concerned chiefly with technical details.

The home-economics staff has worked with State groups and institutions requesting assistance in making surveys and studies for curriculum revision. A member of the staff has served as chairman of a committee on graduate work, which is studying the graduate program in home-economics education and needs for research in this field. Graduate studies in home-economics education at colleges and universities have been listed and indexed, and studies completed since 1930-31 have been abstracted. Bulletins representing extended research on Rooms and Equipment for Instruction in Homemaking and Consumer-Buying in the Educational Program for Homemaking were prepared.

The Commercial Education Service has made substantial progress toward the completion of manuscripts on changes in commercial occupations in relation to high-school commercial courses, and on the teaching of retail selling in high schools. These bulletins will be published this coming year.

During the year a manual for procedure in the conduct of rehabilitating case work, which had been prepared during the preceding year, was published. Research projects in the field of vocational rehabilitation included comprehensive surveys of State rehabilitation programs in 3 States—Iowa, Georgia, and Illinois, as already noted—revision of 2 bulletins, and preparation of a bulletin on a Procedure for the Survey of a State Program of Vocational Rehabilitation, and of a miscellaneous publication on Opportunities for Employment of the Physically Handicapped Under the United States Civil Service.

Principal publications for the year include, in addition to regular reports of regional conferences, the following:

GENERAL

- Misc. 1615. Digest of annual reports of State boards for vocational education to the Office of Education, Division of Vocational Education, for the year ended June 30, 1934.
- Misc. 1623. Vocational education and unemployment. Examples of how vocational education funds are being used for the relief of unemployment. Compiled for State and local vocational staffs to aid them in further promotion of unemployment relief.
- Misc. 1573. Vocational education in the United States. Report presented by the Assistant Commissioner for Vocational Education at the second conference of the Inter-American Federation of Education meeting in Santiago, Chile, September 9-16, 1934.
- C. L. 1697. Anticipated utilization of Federal funds under State vocational programs in the year ending June 30, 1936, as reported to the Federal office by State directors of vocational education.

AGRICULTURAL EDUCATION

- Bulletin No. 178. Teaching farm credit. A discussion of principles and practice together with suggestions to teachers, based on illustrative cases.
- Bulletin No. 180. Summaries of studies in agricultural education. An annotated bibliography of 374 studies in agricultural education with a classified subject index and a general evaluation.
- Misc. 1590. Report of conference on out-of-school farm youth.

TRADE AND INDUSTRIAL EDUCATION

- Bulletin No. 106. Stone setting. The setting of cut-stone trim in brick buildings (revised).
- Bulletin No. 128. Bibliography on foreman improvement. A selected and annotated list of references including books, pamphlets, and magazine articles (revised).
- Misc. 1599. New definitions and interpretations affecting trade and industrial education.
- Misc. 1613. Vocational training for household employment.
- Misc. 1586. Apprentice training under N. R. A. codes. A discussion of the organization of related, technical, and general instruction for apprentices.
- Misc. 1580. Report of conference on new problems in trade and industrial education.

State compulsory school attendance standards affecting the employment of minors. State child-labor standards. (Material prepared by the Children's Bureau of the U. S. Department of Labor.)

Report of conference to study problems of industrial-youth organizations.

HOME ECONOMICS EDUCATION

Bulletin No. 179. A bibliography of studies of the home-economics curriculum. Studies reported during the period 1926 to May 1934. Prepared by a committee of the home economics section, Association of Land Grant Colleges and Universities.

Bulletin No. 181. Planning and furnishing rooms for instruction in home-making. A guide in the selection, arrangement, and use of space and equipment.

Misc. 1163. Studies and research in home-economics education reported by colleges and universities, with supplement indicating studies reported in published form (revised January 1935).

Misc. 1607. An annotated bibliography on adult education for home-economics programs.

Misc. 1569. Vocational-education program in cooperation with the emergency relief (home-economics education).

Misc. 1603. The home-economics program and parent education.

Misc. 1567. Curriculum construction (home-economics education).

Misc. 1568. Consumer education.

Misc. 1635. A study of supervision as it related to improvement of home-economics teachers in service in the vocational departments of Indiana high schools: 1931-35.

VOCATIONAL REHABILITATION

Bulletin No. 161. Organization and administration of a State program of vocational rehabilitation. A discussion of principles and methods involved in the organization and administration of a State program of vocational rehabilitation (revised).

Bulletin No. 148. Vocational guidance in rehabilitation service. A manual of procedure for counseling and advising physically handicapped persons and assisting them in adjusting or readjusting themselves to vocational life.

Misc. 1040. Opportunities for the employment of the handicapped under United States civil service.

APPROPRIATIONS: 1935 AND 1936

Appropriations under the several vocational-education and vocational-rehabilitation acts for 1935 and 1936, for research and service to aid the States and administration of the acts, are shown in table 1; totals of appropriations to the States and Territories under these acts in table 2; and allotments to the States and Territories in table 3.

Appropriations for research, service, and administration which had been reduced in 1933 and 1934 under the economy acts, were in somewhat larger amounts in 1935, and were further increased for the current year 1936.

TABLE 1.—*Appropriations for research and service to aid the States and for administration: 1935, 1936*

Act	1935	1936
Smith-Hughes Act.....	\$180,000	\$192,000
George-Ellzey Act.....	60,000	64,000
Rehabilitation Act.....	58,000	63,500

Appropriations to the States under the Smith-Hughes Act, which, also, had been reduced under the economy acts for 1933 and 1934, were restored in 1935 to the basic appropriations provided in the act. Similar restorations were made in appropriations for Hawaii, Puerto Rico, and the District of Columbia, and the full amounts authorized to be appropriated under the George-Ellzey Act were appropriated for 1935. These appropriations to the States under the several acts have all been provided in the same amounts for the current fiscal year 1936 as for 1935.

TABLE 2.—*Appropriations for allotment to the States and Territories for vocational education and vocational rehabilitation: 1935, 1936*

Act	Appropriation
Smith-Hughes Act:	
Total.....	\$7,167,000.00
Vocational agriculture.....	3,027,000.00
Vocational trade, industry, and home economics.....	3,050,000.00
Vocational teacher training.....	1,090,000.00
George-Ellzey Act:	
Total.....	3,084,603.00
Vocational agriculture.....	1,031,019.75
Vocational trade and industry.....	1,032,191.60
Vocational home economics.....	1,021,391.65
Vocational Rehabilitation Act.....	1,097,000.00
Hawaii.....	30,000.00
Puerto Rico.....	105,000.00
District of Columbia.....	15,000.00

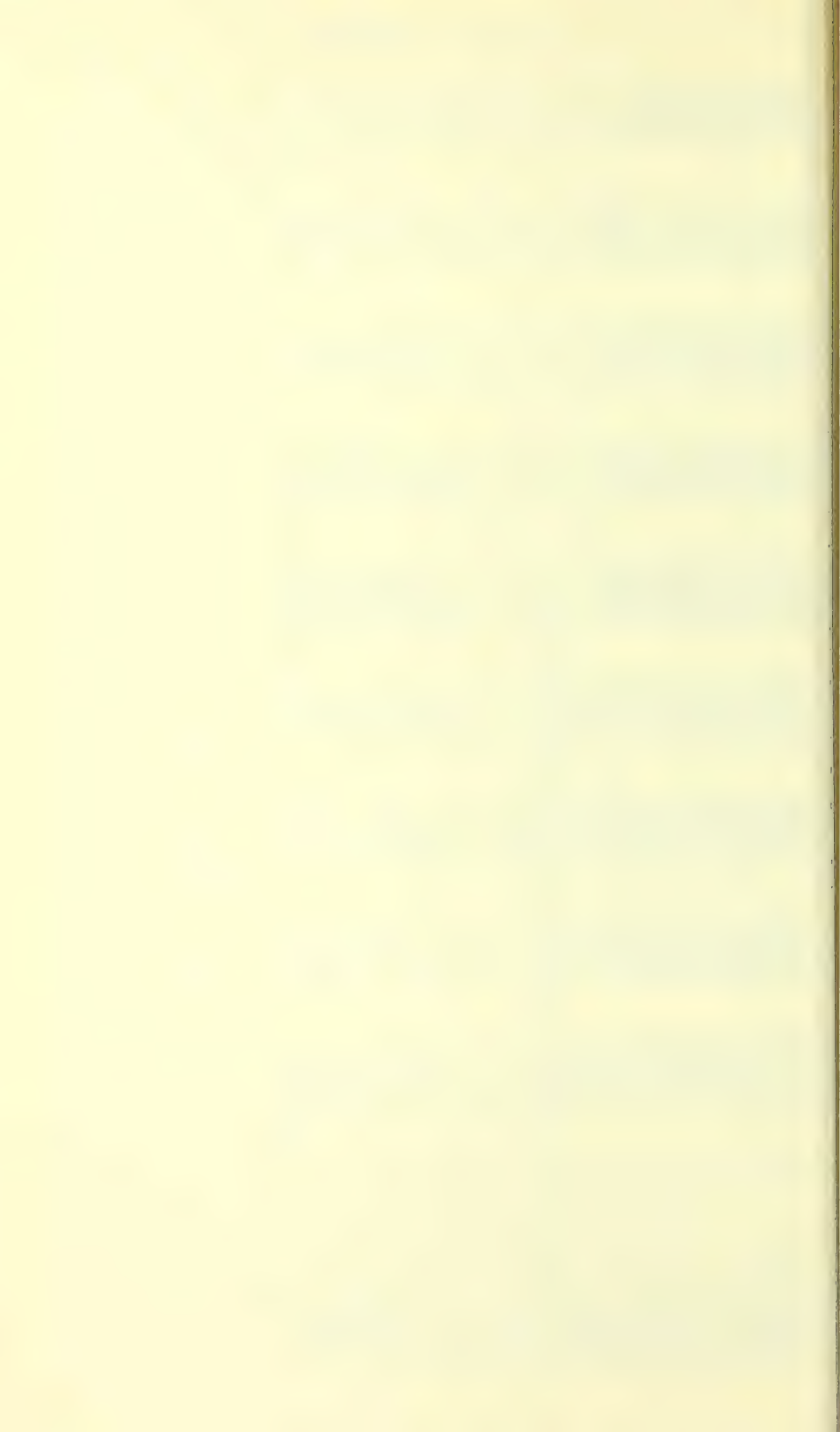
TABLE 3.—*Allotments of Federal money to the States and Territories for vocational education and vocational rehabilitation, years ending June 30, 1935 and 1936*

State or Territory	Smith-Hughes Act			George-Elizay Act				Vocational rehabilitation act
	Total	Vocational agricultural education	Vocational trade, industrial, and home economics education	Vocational teacher-training	Total	Vocational agricultural education	Vocational trade and industrial education	Vocational home economics education
Total.....	\$ 7,157,977.62	\$ 3,018,853.83	\$ 3,049,285.27	\$ 1,089,838.52	\$3,084,603.00	\$1,031,019.75	\$1,032,191.60	\$1,021,301.65
Alabama.....	160,268.82	106,018.23	32,611.15	21,639.44	93,135.83	43,759.65	14,181.83	35,194.35
Arizona.....	35,926.19	15,926.19	10,000.00	15,000.00	15,286.94	5,000.00	5,000.00	10,000.00
Arkansas.....	113,993.95	82,928.87	16,776.23	15,164.85	71,702.61	36,550.17	7,981.72	27,230.72
California.....	313,295.41	84,540.06	182,301.17	46,425.18	103,255.99	20,259.34	54,912.31	15,164.85
Colorado.....	61,536.56	28,737.35	22,779.21	10,000.00	26,957.25	9,234.22	8,176.60	46,425.18
Connecticut.....	80,214.52	26,484.45	40,589.77	13,140.30	30,299.37	5,000.00	16,507.45	10,000.00
Delaware.....	30,000.00	10,000.00	10,000.00	12,000.00	15,000.00	5,000.00	5,000.00	10,000.00
Florida.....	84,785.54	39,488.86	33,290.52	12,000.00	35,191.68	9,108.65	12,914.11	10,000.00
Georgia.....	175,228.68	112,207.67	33,226.98	23,784.03	99,743.24	46,314.07	16,180.15	12,000.00
Idaho.....	47,387.72	17,387.72	10,000.00	10,000.00	16,988.57	6,130.66	5,000.00	23,784.03
Illinois.....	111,199.48	80,412.77	246,935.68	62,308.95	141,551.42	32,625.19	72,011.89	5,838.51
Indiana.....	185,584.34	80,412.77	78,689.02	26,482.55	79,577.06	25,544.44	26,684.23	62,308.95
Iowa.....	146,290.73	83,146.09	42,908.77	20,205.87	75,743.10	31,928.34	16,213.17	26,482.55
Kansas.....	111,527.42	64,167.24	31,978.49	15,381.69	57,137.61	23,080.74	12,746.59	20,205.87
Kentucky.....	101,201.53	70,683.15	35,010.22	17,185.58	87,624.79	38,413.16	15,616.26	15,381.69
Louisiana.....	124,390.87	50,615.30	36,522.14	17,185.58	64,385.30	27,119.04	13,801.93	21,380.55
Maine.....	92,659.43	36,092.80	14,087.15	10,000.00	21,191.88	5,582.94	6,802.52	17,185.58
Maryland.....	295,939.31	23,310.27	167,878.22	13,341.65	35,012.23	7,752.87	15,138.51	10,000.00
Massachusetts.....	270,137.03	55,855.27	144,684.11	39,597.65	57,547.23	5,000.00	44,809.04	13,341.65
Michigan.....	118,887.03	72,816.70	55,103.85	20,966.48	98,133.56	25,944.93	44,087.68	12,150.85
Minnesota.....	124,424.02	93,141.81	14,847.09	20,966.48	71,555.22	20,232.88	18,119.73	7,738.19
Mississippi.....	209,813.81	98,675.62	81,459.38	16,435.12	82,441.92	44,496.42	7,025.68	28,500.95
Missouri.....	39,575.61	12,875.61	10,000.00	29,678.81	96,454.11	36,387.58	27,309.67	30,916.82
Montana.....	82,280.54	49,713.06	21,299.32	11,268.16	18,277.94	6,679.93	6,503.35	26,678.81
Nebraska.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	10,000.00
Nevada.....	10,714.23	10,714.23	11,965.26	10,000.00	15,000.00	5,000.00	5,000.00	10,000.00
New Hampshire.....	32,679.49	10,714.23	146,312.71	33,047.63	60,453.69	5,000.00	42,462.14	5,000.00
New Jersey.....	218,495.63	39,135.29	10,000.00	10,000.00	16,035.83	5,179.26	5,000.00	5,000.00
New Mexico.....	37,642.12	17,642.12	10,000.00	10,000.00	19,615.77	23,505.47	12,901.55	12,901.55
New York.....	679,136.35	115,197.53	461,031.10	102,937.72	190,615.77	52,236.85	17,032.86	5,856.57
North Carolina.....	192,981.96	131,572.08	35,484.35	25,921.63	121,967.34	23,505.47	128,878.71	38,231.59
North Dakota.....	51,635.26	31,635.26	10,000.00	10,000.00	28,473.33	12,971.53	5,000.00	43,677.63
Ohio.....	371,096.69	119,248.45	197,485.50	54,352.74	133,843.01	33,081.63	61,175.07	10,501.80
Oklahoma.....	143,352.81	87,736.55	36,002.87	19,593.39	77,406.22	33,435.59	14,898.52	29,132.11
Oregon.....	57,324.88	25,866.11	21,458.77	10,000.00	23,817.83	7,302.66	7,928.52	8,586.65
Total.....	\$ 7,157,977.62	\$ 3,018,853.83	\$ 3,049,285.27	\$ 1,089,838.52	\$3,084,603.00	\$1,031,019.75	\$1,032,191.60	\$1,021,301.65
Alabama.....	21,638.44	14,181.83	35,194.35	21,639.44	93,135.83	43,759.65	14,181.83	35,194.35
Arizona.....	10,000.00	5,000.00	10,000.00	15,286.94	15,286.94	5,000.00	5,000.00	10,000.00
Arkansas.....	15,164.85	7,981.72	27,230.72	15,164.85	71,702.61	36,550.17	7,981.72	27,230.72
California.....	46,425.18	54,912.31	28,046.34	46,425.18	103,255.99	20,259.34	54,912.31	15,164.85
Colorado.....	10,000.00	8,176.60	16,507.45	10,000.00	26,957.25	9,234.22	8,176.60	46,425.18
Connecticut.....	13,140.30	16,507.45	5,000.00	13,140.30	30,299.37	5,000.00	16,507.45	10,000.00
Delaware.....	5,000.00	5,000.00	5,000.00	12,000.00	15,000.00	5,000.00	5,000.00	10,000.00
Florida.....	12,914.11	16,180.15	5,000.00	12,914.11	35,191.68	9,108.65	12,914.11	10,000.00
Georgia.....	16,180.15	5,000.00	5,000.00	23,784.03	99,743.24	46,314.07	16,180.15	12,000.00
Idaho.....	5,838.51	72,011.89	32,625.19	10,000.00	16,988.57	6,130.66	5,000.00	23,784.03
Illinois.....	26,684.23	26,684.23	26,482.55	62,308.95	141,551.42	32,625.19	72,011.89	5,838.51
Indiana.....	20,205.87	31,928.34	16,213.17	26,482.55	79,577.06	25,544.44	26,684.23	62,308.95
Iowa.....	15,381.69	12,746.59	15,616.26	15,381.69	75,743.10	31,928.34	16,213.17	26,482.55
Kansas.....	21,301.28	12,746.59	15,616.26	15,381.69	57,137.61	23,080.74	12,746.59	20,205.87
Kentucky.....	21,380.55	13,801.93	15,616.26	17,185.58	87,624.79	38,413.16	15,616.26	15,381.69
Louisiana.....	27,119.04	13,801.93	15,616.26	17,185.58	64,385.30	27,119.04	13,801.93	21,380.55
Maine.....	6,802.52	15,138.51	7,752.87	10,000.00	21,191.88	5,582.94	6,802.52	17,185.58
Maryland.....	12,150.85	44,809.04	7,738.19	13,341.65	35,012.23	7,752.87	15,138.51	10,000.00
Massachusetts.....	38,597.65	28,500.95	44,087.68	39,597.65	57,547.23	5,000.00	44,809.04	13,341.65
Michigan.....	30,916.82	18,119.73	25,944.93	20,966.48	98,133.56	25,944.93	44,087.68	12,150.85
Minnesota.....	16,435.12	7,025.68	30,916.82	20,966.48	71,555.22	20,232.88	18,119.73	7,738.19
Mississippi.....	27,309.67	6,503.35	11,268.16	29,678.81	82,441.92	44,496.42	7,025.68	28,500.95
Missouri.....	6,679.93	6,503.35	11,268.16	29,678.81	96,454.11	36,387.58	27,309.67	30,916.82
Montana.....	5,000.00	5,000.00	5,000.00	10,000.00	18,277.94	6,679.93	5,000.00	26,678.81
Nebraska.....	5,000.00	5,000.00	5,000.00	10,000.00	15,000.00	5,000.00	5,000.00	10,000.00
Nevada.....	5,000.00	5,000.00	5,000.00	10,000.00	15,000.00	5,000.00	5,000.00	10,000.00
New Hampshire.....	42,462.14	5,000.00	5,000.00	33,047.63	60,453.69	5,000.00	42,462.14	5,000.00
New Jersey.....	5,179.26	5,000.00	5,000.00	10,000.00	16,035.83	5,179.26	5,000.00	5,000.00
New Mexico.....	12,901.55	5,000.00	5,000.00	10,000.00	19,615.77	23,505.47	12,901.55	12,901.55
New York.....	5,856.57	5,000.00	5,000.00	10,000.00	190,615.77	52,236.85	17,032.86	5,856.57
North Carolina.....	102,937.72	23,505.47	35,484.35	25,921.63	121,967.34	23,505.47	128,878.71	38,231.59
North Dakota.....	23,921.63	12,971.53	5,000.00	10,000.00	28,473.33	12,971.53	5,000.00	43,677.63
Ohio.....	39,582.74	133,843.01	54,352.74	54,352.74	133,843.01	33,081.63	61,175.07	10,501.80
Oklahoma.....	29,132.11	33,435.59	14,898.52	19,593.39	77,406.22	33,435.59	14,898.52	29,132.11
Oregon.....	8,586.65	7,928.52	21,458.77	10,000.00	23,817.83	7,302.66	7,928.52	8,586.65

Pennsylvania.....	537,709.58	172,677.04	256,273.09	78,759.45	180,579.47	27,970.81	95,385.92	57,322.74	78,769.45
Rhode Island.....	47,812.03	10,000.00	27,842.03	10,000.00	17,286.75	5,000.00	7,286.75	5,000.00	10,000.00
South Carolina.....	106,714.19	76,236.31	16,239.29	14,218.59	64,159.77	25,922.51	8,929.47	25,922.51	14,218.59
South Dakota.....	51,323.28	31,323.28	10,000.00	10,000.00	28,138.31	12,740.08	5,000.00	10,398.23	10,000.00
Tennessee.....	156,555.22	95,875.76	39,282.82	21,306.64	86,726.44	39,084.15	15,214.90	31,827.39	21,306.64
Texas.....	343,814.26	191,491.24	104,691.95	47,631.06	178,677.40	76,890.99	37,708.02	63,568.39	47,631.06
Utah.....	35,132.76	13,466.11	11,666.65	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Vermont.....	33,424.97	13,424.97	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Virginia.....	145,433.63	91,209.99	34,419.13	19,804.46	77,295.40	31,041.94	15,974.93	30,278.53	19,804.46
Washington.....	89,381.85	37,840.26	38,757.07	12,784.52	36,179.26	9,949.57	13,668.05	13,561.64	12,784.52
West Virginia.....	104,607.06	68,990.85	21,535.80	14,140.41	51,466.78	14,663.44	13,000.79	22,902.55	14,140.41
Wisconsin.....	169,327.36	77,210.55	68,083.37	24,033.44	76,745.11	28,766.16	22,347.75	25,631.99	24,033.44
Wyoming.....	39,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Alaska.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Hawaii.....	105,000.00	30,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,000.00
Puerto Rico.....			2 60,000.00	15,000.00	15,870.52	5,870.52	5,000.00	5,000.00	

¹ The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

² Trade and industrial education, \$30,000; home economics education, \$30,000.



GENERAL EDUCATION BOARD

(L. M. DASHIELL, Treasurer)

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1935, principal fund, belonging without restriction to the Board, amounted to \$44,415,140.50. This fund is invested in stocks and bonds. In addition the sum of \$11,597,952.21 is reserved to pay appropriations to various educational institutions. This fund is also invested in stocks and bonds. Lapses and refunds on prior years' appropriations amounted to \$1,250,000 and \$470, respectively. The sum of \$499,729.20 was paid during the year ended June 30, 1935.

Appropriations from income during the year aggregated \$4,994,150.03. Lapses on account of prior years' appropriations amounted to \$741,673.71, however, leaving a net increase in income appropriations of \$4,252,471.32.

The income from the above funds, together with income from undisbursed income (and including the sum of \$142.85 received on account of income from the estate of Lucy M. Spelman), amounted during the year to \$2,525,124.35. The balance of income from the previous year as of June 30, 1934, amounted to \$11,334,932.44, together with sundry refunds amounting to \$71,561.84, which increased the total to \$13,860,056.79.

Disbursements from income during the year were as follows:

Whites:

Colleges of liberal arts: General endowment, buildings, and other purposes.....	\$328,988.23
Science of education:	
Schools of education.....	\$353,426.90
Special projects.....	261,149.14
	<hr/> 614,576.04
Natural sciences.....	12,931.56
Medical sciences:	
Schools of medicine.....	248,000.00
Special projects.....	16,156.15
	<hr/> 264,156.15

Whites—Continued.

Humanities	\$150,232.41	
Public education:		
Fellowships	\$43,402.14	
Special divisions in State de-		
partments of education....	168,881.13	
Teacher training.....	33,262.14	
Library training.....	34,050.00	
Studies.....	24,172.36	
Other purposes.....	7,000.00	
		310,767.77
Miscellaneous		161,951.70
General education.....		172,529.55
Child growth and development.....		160,586.89
Training of personnel for the ad-		
vancement of knowledge.....	109,680.53	
		<u>\$2,286,400.83</u>

Negroes:

Colleges and schools: General endowment, build-		
ings, and other purposes.....	515,449.85	
Social sciences.....	12,500.00	
Medical sciences:		
Schools of medicine.....	\$167,476.34	
Special projects.....	7,067.94	
		174,544.28
Public education:		
Summer schools.....	3,889.53	
Anna T. Jeanes foundation..	32,500.00	
John F. Slater fund.....	37,500.00	
Rural-school agents.....	128,585.43	
Fellowships.....	66,229.12	
Special divisions in State de-		
partments of education....	1,500.00	
Other purposes.....	5,372.52	
		275,576.60
Miscellaneous	4,994.54	
		<u>983,065.27</u>
Surveys and studies.....		19,839.23
Miscellaneous projects.....		5,384.22
Administration.....		304,751.75
		<u>3,599,441.30</u>

This leaves an undisbursed balance of income on June 30, 1935, of \$10,260,615.49, which is invested as follows: Securities, \$4,961,906.89; certificates of deposit, \$3,500,000; cash on deposit, \$1,367,719.04, and accounts receivable, net, \$430,989.56. It should be noted, however, that against this balance of \$10,260,615.49 there are unpaid appropriations amounting to \$9,233,709.30, leaving unappropriated income amounting to \$1,026,906.19.

The Anna T. Jeanes Fund, the principal and interest of which are to be used for Negro rural schools, amounted, on June 30, 1935,

to \$107,744.16. This sum is invested as follows: Bonds, \$82,839.16; stocks, \$16,645; and cash on deposit, \$8,260. During the year the sum of \$50,000 was appropriated from principal, which added to the balance unpaid June 30, 1934, totaled \$52,997.50, which was paid in full during the year.

The income from this fund during the year was \$5,112. Added to the balance from previous year of \$6,007.77, the total available income amounted to \$11,119.77. The sum of \$5,815 was paid, leaving \$5,304.77 accounted for in cash on deposit. Of this balance of \$5,815 there were unpaid appropriations of \$2,450, leaving \$2,854.77 available for appropriation.



BUREAU OF MINES

(JOHN W. FINCH, Director)

The Bureau of Mines is primarily a field organization, and although its administrative offices are in Washington its investigations of methods of producing, treating, and utilizing ores, fuels, and nonmetals and its safety training are conducted in the country's principal mining centers and, as needed, at individual establishments.

The Bureau comprises four branches, which were designated Technologic, Economics, Health and Safety, and Administrative during the past year.

The Technologic Branch covers a broad field of research on problems affecting the mining, metallurgical, and petroleum industries and includes the Mining, Metallurgical, Petroleum and Natural Gas, Experiment Stations, and Explosives Divisions.

The Economics Branch compiles and issues data on various economic problems, including statistics on the production and value of minerals. During the fiscal year 1935 it consisted of the Coal, Mineral Statistics, Petroleum Economics, Rare Metals and Nonmetals, and Common Metals Divisions, but on July 1, 1935, was reorganized as the Economics and Statistics Branch and will include the Coal Economics, Petroleum Economics, Metals and Nonmetals, Foreign Mineral Service, and Mineral Resources and Economics Divisions.

The Health and Safety Branch, which studies and endeavors to reduce hazards to workers in the mineral industries, during 1935 functioned in two divisions, Safety and Demographical, the Health Division having been recessed due to lack of funds. On July 1, 1935, the Demographical Division became the Section of Employment Statistics of the Economics and Statistics Branch. Some of the activities of the Health Division will be revived as funds permit.

The Administrative Branch has two divisions—Office Administration and Information. It handles routine administrative matters, such as personnel, clerical assignment, and multigraphing, and is responsible for the editing and distribution of publications and motion-picture films. The Assistant to the Director of the Bureau also acts as chief of the Administrative Branch.

SUMMARY

The following review of Bureau of Mines activities in the fiscal year 1935 discloses a creditable return on an investment of \$1,511,-047.76. New processes have been devised and turned over to the mineral industries, information on the production and distribution of the major minerals has been supplied promptly, and the number of persons who completed safety-training courses increased nearly 40 percent.

Technologic Branch.—Twenty-five electric devices for use in mines passed permissibility tests conducted under supervision of the Mechanical Division. The division continued to aid Federal agencies in suggesting ways for efficient utilization of fuel. Nearly 9,600 samples of coal and coke were analyzed, and the Bureau's coal-sampling truck collected samples at 41 hard-coal breakers in Pennsylvania in cooperation with the Anthracite Institute. The petrographic study of American coals was continued, and data on carbonization products from 30 such coals were published.

The Mining Division assisted operators of small gold and silver mines in solving operating problems. Subterranean water supplies were located in Nevada drought areas by geophysical prospecting methods. Three papers on sand and gravel excavation were prepared. An index of the division's 258 information circulars on mining and milling methods was compiled, an important bulletin on lead was issued, and 14 information circulars were published, as well as the monthly Geophysical Abstracts.

The Metallurgical Division succeeded in developing new methods for agglomeration and flotation of ores, made advances in magnetic separation of minerals, and was able to demonstrate on a pilot-plant scale the reduction of iron ore by natural gas and conversion of this iron into steel by direct melting. The mineral forms of the phosphorus occurring in Alabama red iron ores have been studied. Progress has been made in the explosion shattering of minerals.

The Petroleum and Natural-Gas Division prepared special reports for the Subcommittee on Petroleum Investigation of the House. A gas-saturated oil from Crescent pool, Oklahoma, two commercial repressuring projects (1 in Kentucky and 1 in Oklahoma), and output and input characteristics of Texas Panhandle natural-gas wells were investigated. Special problems were handled for the States of Kansas and Michigan. A bulletin describing manufacture of paraffin wax was completed. Tabulated analyses of Texas and Louisiana crudes were issued. The Amarillo Helium Plant produced over 10,000,000 cubic feet of helium, including 320,000 for the United States Army-National Geographic Society stratosphere flight.

During the year the Experiment Stations Division supervised the work of the Bureau's 11 experiment stations in American mining

centers. The Mississippi Valley Station devised a method of separating sylvite from halite, thus producing fertilizer at lower cost than by the present process. The Nonmetallic Minerals Station developed a scheme for retarding the setting of cement, and the Southern Experiment Station showed how high-grade barite concentrates could be produced from various ores. The Northwest Station has been finding new uses for Washington talcs and soapstones, and has made washing studies of Pacific Northwest coals. A hydrogen sulphide detector was developed, principally for use in the petroleum industry. Eighteen values for limits of inflammability of gases or vapors were determined. Thermodynamic functions were calculated for a number of hydrocarbons and for several other substances. Three hose masks and seven respirators were approved, and numerous extensions of approval were granted.

The Explosives Division added 35 explosives to the active permissible list and transferred 17 to the inactive list. It cooperated with the United States Forest Service in devising specifications for explosives to be used in forestry and road building.

Office of chief mining engineer.—The cause of a series of "bumps" in the Cumberland Mountain coal field (Kentucky and Virginia) was investigated and changes in mining methods proposed to avoid recurrence. A survey of potash-mining methods on Government leases in New Mexico was conducted. A few coal-dust explosion demonstrations were held at the experimental mine.

Economics Branch.—In the Economics Branch of the Coal Division continued to speed up the work of reporting promptly to producers, distributors, and consumers data concerning the supply of and demand for coal and coke. The division supplied much information to the Bituminous Coal Code Authority. The annual peat convass (recessed since 1926) was resumed. During the year 43,400 requests for service were handled.

The Mineral Statistics Division was responsible for compilation of the Minerals Yearbook, an annual volume of data on production, consumption, and distribution of mineral commodities. Work was done to correlate data on man-hours worked and production for 22 minerals. The division made more than 100 annual statistical surveys of important minerals.

The Petroleum Economics Division resumed the national survey of fuel-oil distribution, discontinued in 1931. It made monthly forecasts of the demand for gasoline and crude oil, in addition to its usual fact-finding work on the production and distribution of petroleum products.

The Rare Metals and Nonmetals Division published a number of reports on various mineral commodities and made horizontal studies of minerals by consuming industries. The division maintained lists

of buyers and sellers of rare metals and nonmetals and distributed them on request. Progress was registered in forecasting the demand for minerals.

The Common Metals Division assisted the Tin Investigating Committee of the House and prepared world charts on 15 strategic minerals for the War and Navy Departments. Eleven chapters were written for the Minerals Yearbook. Data were assembled on prices of gold and silver.

The office of the principal mineralogist prepared four chapters for the Minerals Yearbook and answered nearly 1,500 letters on mineral subjects.

Health and Safety Branch.—The Safety Division, Health and Safety Branch, trained over 77,000 persons in first-aid methods during the fiscal year. In addition, 1,132 temporary first-aid instructors' certificates were issued to men who had trained groups under Bureau supervision. Members of the Division personnel attended 448 meetings of Holmes safety chapters and 962 other safety meetings. Seventy manuscripts on topics in the division's field were prepared during the year.

Routine questions on health were handled within the branch, although the Health Division has been recessed for 2 years.

The Demographical Division assembled data on accidents in the mineral industries and noted a general reduction in accident rates. It conducted the annual safety contest, participated in by 334 mines and quarries. Statistics were compiled on the production and consumption of explosives.

Administrative Branch.—The Office Administration Division handled matters of administrative routine during the year. The Bureau personnel numbered 523 permanent and 89 part-time employees. The property of the Bureau, with acquisitions during the year, was valued at nearly 4 million dollars.

The Information Division distributed over 430,000 free publications of the Bureau during the year, answered 61,000 letters of inquiry on general subjects, edited 410 manuscripts, and prepared several hundred illustrations for Bureau publications. Motion-picture films produced under supervision of the division were shown to a total audience of nearly 5 million persons.

Bureau of Mines Advisory Board.—During the year an Advisory Board to confer with the Director on matters of Bureau policy was appointed by the Secretary of the Interior. Its 30 members represent the main mineral industries and the principal mining and labor organizations. The purpose of the Board is to place the Bureau into direct contact with industry, to impart a better understanding of the Bureau's functions, and to give it the benefit of

suggestions by the Board that might guide its activities toward a more effective service.

An all-day meeting was held in Washington, April 15, 1935, at which the work of the Bureau was fully explained. Useful recommendations were made by the Board, and standing committees were appointed to work with the Director on special problems.

FUTURE NEEDS

The branches and divisions comprising the Bureau as they report upon past services point out the need of additional work believed to be of great value in building a sound foundation for future orderly development of our mineral industries. An increase in appropriations has been made for 1936, but is inadequate to support all the useful activities that should be carried on.

The needs of the Technologic Branch are varied to meet the demands of the industries. They call for enlarged laboratory facilities at strategic centers, such as Salt Lake City, Utah, College Park, Md., and Tuscaloosa, Ala.; and, to keep step with the advancing technology of petroleum and natural gas, modernized buildings and equipment are needed at the Petroleum Experiment Stations at Bartlesville, Okla., and Laramie, Wyo. Facilities for the study of factors that may influence the action of explosives should be provided at Pittsburgh. Also at that station the development of additional outlets for the use of coal and its byproducts is an important research project. Many States are requesting assistance in applying geophysical methods of prospecting, which already have proved their usefulness in locating favorable areas for mineral exploration and underground water in desert regions. Operators of small metal mines are bringing increasing numbers of problems to the Mining Division.

The Metallurgical Division aims to prove that pilot-plant tests of some of its processes will demonstrate the economy and efficiency forecast by laboratory experiments. Air-conditioning of mines is an appealing humanitarian study that promises to become an economic necessity as mines increase in depth. Preliminary research on pollution of the atmosphere and of streams by fine particles and chemical solutions indicates the need for further investigation. Improved methods of extinguishing mine fires should be found. An ever-growing number of letters and publications are necessary to answer the great variety of questions from the industry.

Investigations in the experimental mine should also be extended so that mine operators can be shown the causes and methods of prevention of mine disasters and accidents.

In the Economics and Statistics Branch it is the desire to serve producers and consumers of minerals more quickly and systematically. The fuel market should be watched carefully, to permit speedy dissemination of news regarding changes in demand and in competitive sources of power, and make possible a balance of production and consumption. Horizontal studies of minerals according to consuming industries are proving valuable, and investigation of regional, national, and international factors affecting trade conditions can be expanded to advantage. The necessity for conservation should be indicated to the petroleum industry through data that will show present waste as well as proper economic utilization of oil and its products. Plans for reorganization of the Economics and Statistics Branch, which will enable it to make a start in the widened fields of study indicated, have been approved.

Soon the Bureau will issue its millionth training certificate to some graduate of its first-aid classes. Curtailment of funds to support this phase of Health and Safety Branch activity prevented attainment of that record in 1935. As it is, the Bureau is deluged with requests it cannot fulfill—including dozens from executives in charge of Federal work projects involving quarrying, blasting, underground work, or other occupations in the Bureau's field—to train employees to labor more safely and to take prompt action when accidents occur. An accident-prevention course for the bituminous industry already has been given to nearly 9,000 persons, most of them officials. Similar courses should be prepared for the other principal mineral industries and adequate personnel supplied to teach them.

Much information on the Bureau's activities and achievements has been spread by its publications. Funds should be forthcoming to permit results of investigations to be issued in permanent form as soon as possible after they are completed. The present make-shift policy of submitting many of such reports to scientific journals in order to bring them to public attention thus would be avoided and the Bureau would be able to present more effectively its contributions to the efficiency and safety of the mining industry.

FINANCES

The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1935, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were \$1,546,989.94. Of this amount \$1,511,047.76 was spent, leaving an unexpended balance of \$35,942.18. Owing to uncompleted work in the helium program for the Army and Navy there was a carry-over from 1934 of \$53,-

395.04 of helium-plant funds, of which \$50,000 was reappropriated for the fiscal year 1935.

On the regular work of the Bureau \$1,349,764.55 was expended. This figure is subject to slight corrections due to unpaid obligations.

In addition, for the helium program, which is purely service work for the Army and Navy and has no part in the regular plans of the Bureau, \$30,930.87 was appropriated directly to the Bureau, and \$110,000 was transferred from the Army and Navy for the purchase at cost of helium produced by the Bureau for the National-defense establishment.

TECHNOLOGIC BRANCH

MECHANICAL DIVISION

Electricity in mines.—Routine inspection and tests in the Bureau's electrical laboratories led to formal approval of 8 cutting machines, 13 loading and conveying machines, 1 storage-battery gathering locomotive, 1 rock-dust distributor, 1 mine pump, and 1 special electric cap lamp for mine officials.

A simple, inexpensive device to be added to flame safety lamps for detecting methane in coal mines has been developed by the electrical section.

A permanent exhibit showing 10 ways in which an explosion of gas may be caused by faulty and nonpermissible electric equipment and circuits was viewed by more than 700 persons during the year.

Use of fuels.—Tests to determine the heat-insulating effect of soot in domestic heating boilers showed that under ordinary conditions this loss usually is less than 5 percent of the fuel instead of 30 to 50 percent, as often stated.

Investigation of the effect on the burning characteristics of fuels by treating them with small amounts of chemical salts has shown that the claims of large savings to householders by their use are not justified.

A bulletin published during the year discusses the effects on the burning of fuels by applying overfeed and underfeed principles, with preheated air and with air at room temperature.

Fuel economy service section.—To aid Federal agencies to purchase and utilize fuel more efficiently this section made numerous power-plant studies, fuel-efficiency tests, and acceptance tests of new equipment, advised on the selection of proper fuel for specific boiler and heating plants, and acted as consultant to various Government departments on such problems as purchases of fuel and of new equipment, preparation of standard specifications for various types of boilers and stokers, and the development of a system of boiler feed-water conditioning.

Fuel inspection and coal analysis.—By means of its fuel-inspection service and coal-analysis laboratory the Bureau of Mines aids other Federal agencies in purchasing their coal to best advantage and places at the disposal of the public extensive, accurate information on the quality of American coals. During the year 6,721 samples of coal furnished on contract to Federal agencies and 1,595 samples of coal, coke, and carbonaceous products taken in connection with scientific work were analyzed. In addition, ash-fusion temperature determinations were made on 1,092 samples.

To furnish information on which to base awards of contracts for coal the Bureau's coal-sampling truck collected 90 samples at 49 bituminous and semianthracite mines.

In cooperation with the Anthracite Institute 268 samples were collected by the truck at 41 breakers shipping approximately 50 percent of the total anthracite production of Pennsylvania. The weighted average of the analyses of these samples gives a fair picture of the quality of well-prepared Pennsylvania anthracite.

Constitution of coal.—Correlation of western Pennsylvania coal beds on the basis of their microstructure, undertaken in cooperation with the Pennsylvania Geological Survey, has identified several doubtful beds as Lower Kittanning. The petrographic study of American coals in connection with their classification and carbonization has included samples from various States—in particular, block and splint coals and a Pleistocene coal from Washington which was found to represent a new step in coal formation half-way between peat and brown coal.

Coal carbonization.—The yield and quality of carbonization products from 30 representative American coals were described in Bureau of Mines Monograph 5, which made available for the first time data by which the carbonizing properties of these coals can be evaluated by a standard test method. This study is being continued.

Carbonizing studies of a typical splint coal from the Millers Creek bed in Kentucky showed that coke of excellent physical properties could be obtained by blending it with a high-volatile coal, such as the Pittsburgh, in the proportions of 30 percent splint and 70 percent high-volatile bright coal. Blends of splint and low-volatile coal did not produce satisfactory coke.

The kindling and burning properties of cokes were correlated with carbonizing temperature by laboratory test methods, giving valuable indication of the carbonizing conditions under which domestic coke should be made.

Conclusions.—Some additional appropriations for the coming fiscal year will provide much-needed partial restoration of the Bureau's research program on enlarging the uses of coal. The former appropriations of the Bureau should be restored in full to permit

thorough investigation of methods for sampling coal, preliminary to a comprehensive study of the properties of the various American coals and the byproducts obtainable therefrom.

MINING DIVISION

Although operating under a reduced budget, the Mining Division was able to give valuable service to many operators of small precious-metal mines by close field contacts and by publication of a number of circulars dealing with technical problems. This service covers a long-neglected field to which the Nation must look for discovery and utilization of new sources of ore.

Through efforts of the division personnel Nation-wide attention has been directed toward the need of better technical control in many nonmetallic mineral industries. Studies are being made to improve existing conditions.

Early in the year considerable assistance was given new Federal agencies in compiling information from Bureau records. In the latter part of the year much time was devoted to preparing emergency relief projects.

Mining and milling methods and costs—metallic ores.—Bulletin 381, Lead and Zinc Mining and Milling in the United States, was issued. Fourteen information circulars were published. Of these, 4 dealt with mining methods and costs and 1 with mining and milling at individual mines, 1 discussed milling methods at a small gold mine, 3 placer-mining methods and costs, 1 tungsten, and 4 special phases of mining, including 2 designed especially to assist operators of small mines. A subject index was prepared for publication covering the 258 information circulars on mining (metal, non-metal, and coal) and milling methods and costs. Frequent requests for such an index have been made by mine managers and engineers.

Nonmetallic mining. The first 3 of a series of 6 information circulars covering technical problems connected with sand and gravel excavation were published and the other 3 completed in manuscript form. A circular presenting experimental data on domestic mica tended to disprove the current opinion that foreign mica is of superior quality.

Falls of roof and coal.—Investigations on falls of roof and coal were discontinued due to lack of funds.

Geophysical prospecting.—Articles published included Technical Paper 556, A Study of Some Seismometers, and Geophysical Abstracts 63 to 74. Four manuscripts on geophysical subjects were completed; these await funds for printing as technical papers.

Geophysical investigations were conducted to contour bedrock in connection with the location of dam sites in the Muskingum Water-

shed Conservancy District in Ohio. The accuracy of this work was demonstrated by subsequent drilling. Resistivity surveys were made in Nevada for the F. E. R. A. to locate subterranean water supplies, and a reconnaissance field survey in the Boulder Dam region at the request of the Bureau of Reclamation to determine the feasibility of mapping mineral deposits in that area by geophysical methods. A new type of resistivity apparatus was designed, and six instruments were built and furnished to the F. E. R. A. at Reno, Nev.

Conclusions.—Field contacts during the year revealed that the series of circulars on mining and milling methods and costs are being used extensively by operators. Many circulars are out of print, and requests for reprints are increasing. Various Federal and State bureaus have asked the Bureau to make special geophysical investigations. Requests have been received from many sources for expansion of the service to aid operators of small mines.

Funds should be provided for reprinting the more important information circulars, to increase technical aid to small mines, to resume investigations of coal-mining practice, for research on mining and milling practice in relation to operating costs, for ventilation surveys, and for research on air-conditioning hot and dusty mines.

METALLURGICAL DIVISION

Ore-dressing section.—The availability of a new type of chemical reagent characterized by a combination of extremely hydrophile and extremely lypophile groups combined in the same molecule has made possible a distinct advance in flotation technique. The important problem of separating sodium and potassium chlorides was solved in two ways—by selective agglomeration using the new reagent and oil followed by tabling and by straight flotation using only the organic reagent, which is both frother and collector for potassium salts. An emulsion of paraffin oil with these reagents was also found useful as a collector for certain sulphide and oxide ores.

The study of soap flotation applied to tungsten ores was completed, and the results have been published.

A method was developed for separating chert from limestone in rock used in cement making by tabling after agglomeration. The process makes available the low-grade material now left in the quarries and will supersede the hand-picking now employed.

Research on the fundamentals of grinding has been continued. In ball-milling a means of calculating a revised ball charge better adapted to grinding ore to a fine size has been developed. Extensive comparisons of wet and dry grinding have been made. Roll grinding has been studied. Innovations introduced by inventors to increase ball-mill efficiencies have been tested. A home-made drag

classifier was improved further and brought to a high state of efficiency. Much grinding was done in closed circuit.

X-ray work has been pursued to determine the surface conditions of flotation films and to study the effect of lattice discontinuities on the magnetic properties of magnetite.

The flotation of nonsulphide minerals has progressed. A Vermont talc ore was studied; the gangue, which had been regarded by the operator as dolomite, was found to be magnesite. Flotation gave a high-grade talc product and a magnesite byproduct that may prove of more value than the talc.

Laboratory treatment of a Nevada cobalt ore and of a complex Arizona molybdenum-vanadium ore was developed. A Bureau engineer assisted in putting the latter process into commercial use.

An improved laboratory elutriator was designed and tested. The need for accurate determination of fine material is becoming increasingly important, as many buyers of nonmetallics now specify sizes by microns.

A pilot plant for table-concentration tests of classified feeds was installed in cooperation with the Missouri School of Mines and Metallurgy.

Iron and steel section.—The Bureau participated informally in constructing and operating a pilot plant for producing sponge iron by natural-gas reduction, in accordance with the method it had described previously. The project was entirely successful, and the products were found to be suitable for conversion into wrought iron or steel. The properties of some of these products were studied and the results have been published. A detailed report of the construction and operation of the pilot plant is being prepared.

A study of iron ores varying in reducibility and porosity over a range of 6 to 1 has furnished a basis for blending ores and a means for determining the size to which ores should be crushed. Practice has shown that crushing and sizing an ore of medium density saved a large amount of fuel.

Methods advocated by the Bureau for determining the gas-flow characteristics of blast furnaces and for correcting undesirable conditions by changes in methods of filling were applied to commercial furnaces with a substantial saving in fuel.

Information from the Bureau's laboratory results on the relative desulphurizing power of blast-furnace slag is being used in the industry to adjust conditions in the lower-alumina slags which have resulted from increased use of concentrates deficient in alumina.

A study of the mineral forms in which the phosphorus of Alabama red iron ore occurs has been completed. The red ores of the Birmingham district, the principal source of Birmingham pig iron, contain on an average about 0.28 percent phosphorus. It is custom-

ary at blast-furnace plants to obtain a certain amount of low-phosphorus ore or concentrates from outside sources to mix with the Birmingham ore to keep the phosphorus in the pig iron within the 0.8 percent maximum permissible in the manufacture of cast-iron pipe from the pig iron. The high phosphorus content of the pig iron usually renders it unsuitable for manufacture of machinery castings. Investigators occasionally have studied the possibilities of removing the phosphorus from the ores by leaching but have been handicapped by lack of knowledge as to the forms in which the phosphorus occurs. Investigations completed during the past year have shown conclusively that in the unleached or hard red ores the phosphorus occurs principally as calcium phosphate, while in thoroughly leached outcrop ores the small amount of phosphorus which has not leached out along with the lime is mainly in the form of ferric and aluminum phosphates.

Special studies section.—New methods of attack in the campaign for lowering crushing and grinding costs, a considerable item in the market price of the metals, have resulted from further studies on explosion shattering and on the magnetic properties of minerals. Under proper control of moisture and impact, explosion shattering has been shown to compare favorably in power cost with the best that can be obtained by grinding in ball mills to the same degree of comminution. By igniting and exploding an arsenical pyrite ore the extraction of gold by cyanidation was increased from 68 to 80 percent.

A simple, direct procedure for using standard magnetite ore to measure the efficiency of crushing and grinding machinery has been evolved as a practical byproduct of the theoretical study of the magnetic properties of mineral powders. A rapid method of demagnetization peculiarly suited for the treatment of crushed material produced in the magnetic roasting process of beneficiating low-grade iron ores is another practical development of the study.

Copper metallurgy section.—The studies on flash-roasting copper concentrates indicate that the calcines may be made amenable to leaching but that metallic copper cannot be produced satisfactorily in one operation, even by adding reducing agents to the feed or to the furnace gas. By flash roasting, followed by leaching, the copper can be obtained in solution, the iron as a pure iron oxide residue and the sulphur as relatively rich sulphur dioxide gas.

Metallurgical fundamentals section.—The active research during the year included investigations of low-temperature specific heats, heats of fusion and melting-point data, thermodynamics of chromium reduction, and density changes in cold-worked metals. The thermodynamic study of metallic carbonates was completed and has been described for publication.

Metallurgy of lead and zinc section.—A detailed report covering the work of the Bureau on reduction of zinc ores by natural gas has been published. The work on smelting zinciferous charges in the blast furnace has been completed and published in a series of reports of investigations.

Metallurgy of precious metals section.—Many problems in the recovery of gold and silver from refractory ores have been studied. The results have been prepared for publication. Among the findings of more general interest are the depressing of clean gold, argentite, and cerargyrite in the flotation circuit by sodium sulphide and the effect of impurities on the loss of mercury in amalgamation.

Conclusions.—The following projects should be mentioned as particularly outstanding among those brought to successful consummation during the year:

1. The application of the type of chemicals known in the textile industry as "wetting-out agents" to flotation and agglomeration of ores, particularly soluble salts such as sodium and potassium chloride, which must be treated in saturated brine.

2. The demonstration of a linear relation between surface and coercive force in magnetic minerals and its application to magnetic separation and to the determination of grinding efficiencies and other metallurgical data which required surface determination at very fine sizes.

3. The pilot-plant demonstration of the practicability of reducing iron ore by natural gas and the conversion of this direct iron into steel by direct melting and by forging and rolling before melting. The structure and properties of the iron so produced were studied in detail.

The necessity of carrying the work of the division past the laboratory and into the pilot-plant stage in order that it may be of real service in building up new metallurgical industries has become obvious. The elements of cost that determine the willingness of industry to put new processes to use can be determined only in this way. Funds for the erection and operation of a versatile metallurgical test unit of pilot-plant size are needed. Location at Boulder City, Nev., where power and Federal buildings are available and important mineral deposits are close at hand, is suggested.

PETROLEUM AND NATURAL-GAS DIVISION

A form of cooperation new to the Bureau of Mines was the assignment of three engineers of the division to duty with the Special Subcommittee on Petroleum Investigation of the House Committee on Interstate and Foreign Commerce, at the request of Hon. William P. Cole, Jr., chairman. In addition to serving as technical advisers

these engineers prepared two reports, published in the subcommittee hearings; one dealt with petroleum development and production and the other with the effect of technologic factors on the supply of and demand for petroleum products.

Production of petroleum and natural gas.—Results of study of the flow of crude oil through oil sands, by laboratory investigations of consolidated sand cores from oil- and gas-producing horizons, conform to the relationships obtained previously on unconsolidated sands. Knowledge of flow of wells and reservoir conditions was advanced by study of a sample of gas-saturated oil obtained under a pressure of 2,800 pounds per square inch at a depth of 6,100 feet in the Crescent pool, Oklahoma. A covering report is in preparation, and a paper on petroleum solubility and liberation phenomena and their practical application was read before a technical society.

Laboratory investigations reported last year, which showed definitely that oxidation by contact with air changes the characteristics of oils, were supplemented by a study of two commercial repressuring projects using air and air-gas mixtures as the repressuring media. One project, in Kentucky, contains about 800 producing wells; part of the field has been repressured with air since 1929. The other is a large property in Nowata County, Okla., repressured with air-gas mixtures. Production data obtained from these two areas will show the effect of repressuring with oxidizing gases on the quality and quantity of oil from a given formation.

A report was prepared for publication, giving results of the study of output and intake characteristics of natural-gas wells in the Texas Panhandle field. It was demonstrated that the rates of input may be determined from a law similar to that previously established for rates of output. A monograph on the flow of natural gas through high-pressure transmission lines and one discussing back-pressure data on natural-gas wells were also prepared.

Engineering field studies.—A technical paper was issued describing equipment used in drilling wells and producing oil in the Oklahoma City field; subsurface conditions in the Zwolle (La.) field and the use of acid in that area to stimulate production were covered in another report. Practical methods of disposing of oil-field brines were studied in cooperation with the Kansas State Board of Health; a preliminary report on brine disposal in the Ritz-Canton field, McPherson County, is in preparation, and preliminary studies of the oil and gas field in the Walnut River drainage area have been made.

Cooperation with the Department of Conservation, State of Michigan, was continued, and the extent and availability of natural-gas reserves in the Michigan "stray" sandstone horizon were estimated. The availability of gas from reserves in central Michigan is particu-

early important in the commercial operation of the fields since the gas-producing areas and the gas reserves per acre are comparatively small.

Special engineering problems.—A bulletin on methods and equipment for reducing evaporation losses of petroleum and gasoline was issued, and a technical paper on losses of gasoline at bulk-storage stations is in press.

Chemistry and refining.—A bulletin describing manufacture of paraffin wax from petroleum is in press. Methods for determining "molecular" weights of higher-boiling petroleum fractions were investigated in cooperation with 16 research laboratories of oil companies and universities. Results obtained by the laboratories on identical samples varied widely. It is hoped that a suitable method for determining molecular weights of high-boiling petroleum fractions may be developed.

A report of investigations tabulating analyses of Texas crude oils and another containing analyses of crudes from some southern Louisiana fields were published. A report has been written covering experimental work on refining Rocky Mountain high-sulphur petroleum (black oil) before the Laramie (Wyo.) field office was closed June 30, 1933, due to lack of funds. With the reopening of this office in July study of the problem will be resumed.

Helium section.—The Amarillo (Tex.) helium plant produced 10,218,840 cubic feet of helium—320,000 for the United States Army-National Geographic Society stratosphere flight and 9,898,840 for use by Army and Navy airships. The average purity was 98.33 percent helium—a new record.

The rock pressures of the wells in the Government-owned helium-bearing Cliffside field indicate a depletion of slightly more than 2 percent of the gas reserve after more than 68,600,000 cubic feet of helium has been produced in 6 years. National defense thus is assured a supply of helium for a long period to come. The available gas supply from the Cliffside field was increased by drilling a new gas well, completed with an open flow of 12,000,000 cubic feet per day. Helium research in the cryogenic laboratory, important in improving methods of helium production and reducing costs, was discontinued for lack of funds.

Conclusions.—One of the two most pressing needs of the Petroleum and Natural-Gas Division—additional operating funds—has been relieved to a gratifying extent for the coming fiscal year. The next most pressing need, which has existed many years and is as urgent as ever, is for additional buildings at the Petroleum Experiment Station, Bartlesville, Okla., to remove the handicaps of inadequate equipment and improper working conditions.

The division plans to resume as rapidly as possible the studies suspended in recent years due to curtailment of appropriations and to carry on its unified program of research to the extent that funds allotted will permit. Additional funds are needed to extend the Bureau's studies in American oil and gas fields.

Even in the face of curtailed demand for helium, provision should be made to preserve the valuable Government-owned gas properties near Amarillo, Tex., and to maintain the Amarillo helium plant in an operating status by retaining the nucleus of a trained personnel. Funds should be provided for research on natural gases and their constituents in the cryogenic laboratory.

EXPERIMENT STATIONS DIVISION

The Experiment Stations Division has administrative control over and coordinates the work of the 11 experiment stations at which most of the technologic studies of the Bureau of Mines are conducted. In addition, the division exercises technical supervision over the Bureau's research on nonmetallic minerals, coal preparation, coal processing, and gas and fuel chemistry.

The most important contribution to nonmetallic mineral technology made by the Bureau in 1935 was the development at the Mississippi Valley Experiment Station, Rolla, Mo., in cooperation with the Missouri School of Mines and Metallurgy and the Potash Co. of America, of processes for the mechanical separation of sylvite (KCl) from halite (NaCl) by agglomeration and tabling or flotation. This development, forecast in the 1934 report on the basis of small preliminary laboratory tests, was carried to a successful conclusion and turned over to the potash industry. While this method does not give a product as pure as that obtained by solution and fractional crystallization, it produces material of higher grade than is demanded by the fertilizer industry at less cost than by solution methods.

In addition, chemical methods have been developed on a laboratory scale at the Nonmetallic Minerals Experiment Station, for producing potassium sulphate, potassium carbonate, potassium hydroxide, anhydrous sodium sulphate, magnesium compounds, and various fertilizer salts from domestic polyhalite. Some of these chemicals are now largely imported, and all are important to the American chemical industry.

Work of experiment stations.—The largest station is at Pittsburgh. It is engaged in the study of coal mining in all its phases, including mine safety, first aid and mine rescue work; fuels chemistry, utilization, processing, and constitution; toxicity of industrial gases; and metallurgy of iron and steel. With this station are co-

ordinated the work of the Explosives Experiment Station and of the Experimental Mine, both at Bruceton, Pa., 14 miles from Pittsburgh; both are operated exclusively for scientific research.

The Petroleum Experiment Station, Bartlesville, Okla., studies the production, consumption, and utilization of petroleum and natural gas.

The Southern Experiment Station, Tuscaloosa, Ala., is concerned with the preparation of coal and the beneficiation of various metallic and nonmetallic ores of the South.

The Nonmetallic Minerals Experiment Station, Rutgers University, New Brunswick, N. J., conducts inquiries into the treatment and utilization of nonmetallic minerals and their products.

Beneficiation of the low-grade iron ores of the Lake Superior district and fundamentals of iron blast-furnace operation are investigated at the North Central Experiment Station, Minneapolis, Minn.

At Rolla, Mo., the Mississippi Valley Experiment Station handles problems in ore dressing, including the determination of fundamental principles and the application of these data to the various ores of the United States, especially the lead and zinc deposits of the region.

The Intermountain Experiment Station, Salt Lake City, Utah, studies the treatment of complex, low-grade ores, lead smelting, and the relation between mineral occurrence and operating results.

The Rare and Precious Metals Experiment Station, Reno, Nev., is interested in more efficient production of unusual and valuable metals and utilization of low-grade ores not now of commercial value.

The Southwest Experiment Station, Tucson, Ariz., endeavors to give assistance with the mining and metallurgical problems of the Southwest, especially those that affect the mining and treatment of low-grade copper ores.

The Pacific Experiment Station, Berkeley, Calif., conducts highly specialized physical-chemical research, chiefly concerned with the determination of fundamental metallurgical constants and the application of these data to metallurgical operations.

The Northwest Experiment Station, Seattle, Wash., investigates the beneficiation and utilization of the coals and nonmetallic minerals of the Pacific Northwest and Alaska.

Alteration of properties of cement by seasoning.—The Nonmetallic Minerals Experiment Station showed that exposure of cement to air of controlled temperature and humidity subsequently decreased the water requirement and decreased the evolution of heat during setting; furthermore, the setting process was retarded without using any of the substances usually added to produce this effect. These

discoveries will prove important in the preparation of cement for large concrete structures.

Concentration of barite.—High-grade barite concentrates can be made from the high-iron barite ore of Tennessee and the high-silica ore of South Carolina, using methods developed during 1935 at the Southern Experiment Station, in cooperation with the University of Alabama. This development is significant, since barite is considered one of the strategic minerals and the reserves of commercial-grade ore in this country are limited.

Development of northwestern mineral resources.—Investigations at the Northwest Experiment Station have shown that certain Washington talcs and soapstones can be used for furnace linings in the soda-recovery furnaces of the paper industry and that the powdered products from other deposits may have value as fillers. Certain sand deposits were shown to be suitable for use in foundries, as abrasives, and, after proper treatment, for bottle glass.

Coal washing.—Based largely upon coal-washing studies of Pacific Northwest coals at the Northwest Experiment Station in cooperation with the College of Mines, University of Washington, one new coal washery with a capacity of 3,000 tons per day is being constructed in Washington, and another is being designed for immediate construction.

In cooperation with the University of Alabama the Southern Experiment Station completed washability studies of samples from the Henry Ellen and the Mary Lee coal beds showing possible reduction of ash in efficiently operated washing plants. The ash content of the washed coal has been lowered without increasing the washery loss.

Grindability of coal.—The laboratory test for measuring grindability of coal was developed by the northwest station to the point that it was accepted by the American Society for Testing Materials as a tentative standard.

Development of analytical procedures for gases and vapors.—The development of practical detectors and analytical procedures for harmful gases and vapors is essential to the establishment and maintenance of safe, hygienic conditions in the mineral-producing and consuming industries. A new microchemical test was worked out for determining atmospheric contamination with benzol vapor in byproduct- and solvent-using plants. A description of a hydrogen sulphide detector, developed primarily for use in the petroleum industry, was published as a report of investigations.

Stream-pollution investigation.—Several States did work by Bureau of Mines methods which showed conclusively the practical value of the Bureau recommendation for sealing abandoned coal mines to mitigate stream pollution by acid coal-mine drainage. In West

Virginia acid was reduced 80 to 85 percent in less than 1 year after 215 mines were sealed.

Inflammability of gases and vapors.—Investigations of the inflammability and ignitibility of gases and vapors, the influence of inert gases on these properties, and public, industrial, and municipal gas-explosion hazards were continued. Eighteen new or revised values for limits of inflammability of gases or vapors in air or oxygen were determined. The extinction of flames by the use of nitrogen and carbon dioxide was studied, and means for preventing gas explosions by controlling the oxygen concentration of combustible mixtures were developed.

Fundamental gas studies.—Calculation of thermodynamic functions from spectroscopic data on propane, butane, pentane, tetraethyl, methane, nitrous oxide, and carbon dioxide were completed. These functions are useful in calculating theoretical yields and heat balances in proposed processes for manufacturing useful chemical substances from waste natural gas and coal gas.

The new theory of flame propagation developed last year in connection with explosion-prevention research has been applied successfully to ozone flames. After burning was shown to be nonexistent in explosions of nitrogen, carbon monoxide, and methane. A complete theoretical analysis was made of the data on upper and lower explosive limits of hydrogen-oxygen-inert gas mixtures, including for the first time a correct treatment of chain-breaking at the walls.

Devices for respiratory protection.—New approvals granted during the year include 3 hose masks, 1 with a positive-pressure blower supplying 1 or 2 men and 2 with velocity-blade-type blowers, 1 of which is approved for 1 or 2 men. Numerous extensions of existing approvals were granted. Six respirators (type A) were approved for protection against pneumoconiosis-producing or nuisance dusts. One respirator (type C) was approved for protection against inhalation of the mist of chromic acid. Several extensions of approval were granted for various improvements on these devices.

Fan-performance and fan-gage charts.—The application of graphic charts to the solution of fan-performance problems was studied exhaustively. A number of compact and convenient forms were evolved by means of which such problems can be solved easily and quickly. An ingenious combination of indicating pressure gages and a chart was developed for mine-fan installations; it permits direct determinations of the efficiency of operation and the quantity of air handled.

Conclusions.—A review of the forgoing accomplishments shows a tremendous return on the expenditure. The first successful process for mechanical beneficiation of potash ore or the new methods for domestic production of several chemicals now largely imported can return to industry in a short time more than was spent for all the

research of the division. Dollars cannot measure the value of the increased safety with which workmen can labor because of the data on inflammable limits of gases and vapors determined by the Bureau or because of the more efficient devices for respiratory protection that have resulted from the year's approval studies. If such significant progress is possible under the handicaps of the past few years, it is obvious that still greater accomplishments can be expected with increased appropriations.

In the field of nonmetallic-minerals investigations the extension of research on chemical and physical properties of fine particles in relation to their solution, dispersion, coagulation, and settling in various media is needed urgently to reduce pollution of air by fly ash from power plants burning powdered coal, to prevent stream pollution from coal-washery wastes, and to collect finely divided minerals from slimes in metallurgical plants.

In gas research the fundamental investigations on ignition and propagation of gas explosions should be extended, since the results to be obtained have such wide applicability to safety. The origin and evolution of combustible and irrespirable gases in mines and tunnels, the relative hazards in underground use of various fuels for internal-combustion engines, the prevention and removal of dust, air conditioning, gas diffusion, and extinguishing of underground fires should be given intensive study.

EXPLOSIVES DIVISION

Physical and chemical tests of explosives.—Aside from a limited number of investigations undertaken at the request of State mine departments and several branches of the Federal Government the work of the Explosives Division was confined largely to making tests under current schedules. During the fiscal year 1935, 32 explosives were added to the active permissible list, and 17 explosives were transferred from the active to the inactive list, leaving 148 permissible explosives. The active permissible list also includes five models of blasting devices.

The Explosives Division assisted the United States Forest Service in inaugurating a system of purchasing explosives suitable for use in forestry and road building. This required, among other problems, the development of a test to determine the fire-setting capacity of explosives to ascertain their suitability for use during forest-fire seasons.

Conclusions.—The explosives research work of the division, which has been suspended because of reductions in allotments, should be resumed. Studies of certain variables are needed to see if the present procedure for testing explosives for placement on the active

permissible list can be improved, but increased personnel would be necessary. These investigations should cover various methods of loading explosives, the dimensions of the borehole, temperature, humidity, and other factors that might influence the action of the explosives.

OFFICE OF CHIEF MINING ENGINEER

Coal-mine "bumps."—A series of disastrous "bumps", killing many miners, has occurred during the past 2 years in coal mines of the Cumberland Mountain field, Kentucky and Virginia. At the request of a coal operators' association the chief mining engineer was detailed to investigate and report possible causes and remedies. Changes in the mining method were proposed which might alter the sudden, violent failure of the strong overlying rocks by compression, causing "bumps", to tensile breaks that would be without shock. The method is being tested, so far with success.

Potash salt-mining methods at Carlsbad, N. Mex.—The New Mexico potash mines are operated on Government leases under supervision of the United States Geological Survey. The Survey requested of the Bureau a report on methods for obtaining complete recovery of potash salts without causing rupture of overlying strata and thereby admitting water from formations above. A mining method was devised based on the compressibility of potash salts as determined by tests of specimens at the Bureau's Experimental mine. Convergence records of the roof and floor are to be made in the mine as trial of the proposed method proceeds.

Experimental mine investigations.—The tests of potash specimens mentioned above disclosed that under high pressure the potash salt is plastic that tentatively the load on pillars in initial development should not exceed 2,000 pounds per square inch, and that above this pressure the salt deforms plastically. This last property is valuable in final mining, as the pillars are mined out gradually, allowing slow compression without sudden collapse.

Owing to insufficient funds, it was impossible to carry on a program of large-scale investigation of the explosibility of coal dusts, but explosion demonstrations were made before large groups of mining men at the request of safety associations.

Repairs were made to the experimental mine through allotment of funds from the Public Works Administration, and a mine fire in adjoining property was controlled successfully by relief workers.

Laboratory dust-inflammability studies.—Fifty-two samples of coal and other dusts, including dusts from the Holland Tunnel ventilating ducts, smelter flues, and steel mills, were tested for relative

inflammability. Chemical solutions for wetting coal dust and the absorption of water by different rock dusts were also studied.

Mine Safety Board.—The members of the Board are the chief mining engineer and the chiefs of the Health and Safety Branch, the Technologic Branch, and the Mining Division. During the year mine-disaster reports and certain safety matters were considered. One mine safety decision formulated was approved by the Director and thereby became embodied in the policy of the Bureau, with previous decisions.

ECONOMICS BRANCH

COAL DIVISION

Service to coal industry.—The Coal Division rendered 43,400 individual services during the year by mail, telephone, or personal interview, exclusive of the distribution of regular publications to established mailing lists. The division issues a series of current reports, available to producers, distributors, and consumers, that follow short-time movements of supply and demand; it also prepares detailed annual reports that provide a background for the current service and trace underlying changes in the industry.

Speeding up work.—The outstanding achievement of the year was continued speeding up of the work and prompt release of the final annual figures. The good record of the previous year was maintained; for example, the manuscript for the annual chapters on coal and coke for the Minerals Yearbook were completed by May in both 1934 and 1935. As heretofore, the final annual figures were mimeographed and released to the public before they were issued as printed pamphlets. Special effort was made to release the reports earlier to comply with many requests from the N. R. A.

Monthly bituminous-coal production, by N. R. A. code-authority areas.—At the request of the N. R. A. the Bureau of Mines assisted in canvassing monthly production by code-authority areas. The results of these surveys were published by the Bureau.

Production of peat.—Since no summary of peat production has been issued later than 1926, the Bureau deemed it advisable to undertake such a canvass for 1934. A chapter embodying these data will be included in Minerals Yearbook, 1935. The results of the survey may help domestic producers to recover some of the domestic market now supplied from foreign sources.

Special investigations.—Special publications released during the year include studies of the mechanical cleaning of bituminous coal and of the mechanized mining of bituminous coal and anthracite.

Economies in publication.—The collection of statistical reports through trade agencies, inaugurated several years ago to reduce costs,

was followed in the fiscal year 1935. The cooperative arrangement with the National Association of Purchasing Agents for collecting current reports on coal stocks and consumption continues to be very satisfactory. Publication costs were cut by combining reports and condensing tables to make more efficient use of available space. Editions were reduced, and national coal-trade organizations assisted by reprinting extra copies.

Conclusions.—Agencies established under the National Industrial Recovery Act taxed the facilities of the division to supply data on the coal and coke industries. In addition to supplying information to the Bituminous Coal Code Authority the division has answered many requests for information from the Reconstruction Finance Corporation, the Public Works Administration, the Division of Subsistence Homesteads, the Federal Emergency Relief Administration, the Tennessee Valley Authority, the Federal Housing Administration, the Federal Securities and Exchange Commission, and the Federal Power Commission. In all such work the division's service is limited to finding and certifying the facts that may be established by the statistical record or derived immediately therefrom.

The efficiency of the service the division can render would be increased if funds were provided for printing reports in detail and publishing additional data on the coal industry. Producers and consumers of coal should be supplied with the following basic information of national scope:

1. Annual detailed surveys of the distribution of coal from each producing to each consuming market, urgently needed to show changes under altered conditions in the industry.
2. Annual statistics of the domestic fuel market, involving the equivalent of 160,000,000 tons of coal, which would help the coal industry to hold its proper share of the market.
3. Current information on changes in production capacity, which would show the industry the probable effect of such changes on the market and might discourage unnecessary or unwise expansion.
4. Economics of byproduct recovery; studies of supply and present and potential demand for the byproducts of coal processing.
5. Statistical analyses of the competitive relations between coal, fuel oil, natural gas, and hydroelectric power.

MINERAL-STATISTICS DIVISION

The division met the need for early release of statistics by mimeographing periodic current reports and preliminary mineral market summaries. Of the latter, annual reviews for 1934 on more than 25 important commercial minerals had been published by April 1935.

Minerals Yearbook.—Minerals Yearbook, 1934, comprising 1,154 pages and including 72 chapters, 106 illustrations, and a comprehensive index, was issued in October 1934. This annual volume represented a decided improvement over Minerals Yearbook, 1932-33, in that statistics and analyses of current developments in the mining industry were printed in more complete form.

Employment data.—Various Federal, State, and industrial agencies have evidenced keen interest in the Bureau's long-time records of employment in mining camps, particularly in connection with current relief and employment problems. The division has been asked to cooperate with such organizations as the F. E. R. A. and the National Resources Board in supplying information. To make employment data of greatest usefulness to producers the figures are correlated with those on man-hours worked and on production. Complete reports for the iron-ore and mercury industries, covering employment, man-hours worked, and output per man-hour during the past 10 years, were published during the year, and similar studies were undertaken for 20 other minerals.

Market information on mineral products.—By making more than a hundred annual statistical surveys of metallic and important non-metallic minerals (except mineral fuels) this division compiles essentially the only market information available on supply, demand, and utilization of specific mineral products. It prepares statistical material for most of the Minerals Yearbook chapters, compiles data on world production, arranges for statistical studies in cooperation with 16 States, and maintains field offices at San Francisco, Salt Lake City, Denver, and Joplin which not only collect statistical data but also give direct information to the mining industry.

Conclusions.—Shrinking markets, disappearing profits, idle capacity, unemployment, and huge accumulations of metal indicate the need for continued intensive research in mineral economics. In attempting to adjust themselves to the present situation mineral producers should have comprehensive information on mineral resources, output, consumption, distribution, and trade conditions, as well as on regional and international factors that affect the movement and utilization of mineral commodities. As the division's present resources are taxed to the utmost its funds would have to be doubled to permit organization of an adequate basic information service.

PETROLEUM ECONOMICS DIVISION

The Petroleum Economics Division maintained and improved its regular services during the fiscal year. The monthly petroleum statement was enlarged to include data on the movement of crude

oil and refined products from the Gulf of Mexico to the Atlantic seaboard. There has been a steadily increasing demand for information concerning sales of fuel oil, particularly Diesel oil, by States and industries. Accordingly, the national survey of fuel-oil distribution, which was begun in 1926 but discontinued in 1931, was resumed to cover the calendar year 1934.

The weekly report on crude-oil stocks and the monthly report on crude-oil movements prepared by the division from data collected on questionnaires of the Petroleum Administrative Board were continued throughout the year. A new series of cooperative reports covering the distribution of natural gasoline was inaugurated in January 1935.

The Supreme Court decision of May 27, 1935, invalidated the control provision of the Petroleum Code, including the part that made it mandatory for operating companies to submit statistical data. It therefore became necessary for the Bureau of Mines to collect these data on a voluntary basis, as had been its practice with similar data in the past.

The division, in cooperation with the Petroleum Administrative Board, made monthly forecasts of demand for gasoline and crude oil and recommended to the Petroleum Administrator production allowables for the various producing States, as prescribed in the code. After invalidation of the code the petroleum industry and most of the important producing States requested the Interior Department to permit the Bureau to continue this work, the forecasts to be recommendatory for use as an economic guide. Inasmuch as the division collects and compiles virtually all of the supporting data and has several specialists engaged in studies of demand it was relatively simple to prepare the forecasts for July and August.

The new work undertaken at the inception of the Petroleum Code rounded out the fact-finding work of the division to virtually 100-percent coverage. All of the questionnaires or surveys have demonstrated their usefulness, and none should be abandoned.

The division has been handicapped by the lack of a specialist on natural gas and natural gasoline. The importance of these subjects justifies the expenditure of much more time and money to study them than have been available in the past.

Conclusions.—The usefulness of the work of the Petroleum Economics Division has been evidenced by expressions of appreciation and approval of its fact-finding service by the petroleum industry. New studies undertaken to supply information essential to code administration have proven invaluable to the industry and should be continued.

RARE METALS AND NONMETALS DIVISION

Responsibility for furnishing information on 82 chemical elements and nearly 1,000 mineral combinations of these elements has been placed on the Rare Metals and Nonmetals Division. To cope effectively with the many inquiries on these numerous and diversified commodities the division some 6 years ago instituted a program of research and writing directed toward preparing published summaries that would anticipate the questions asked most frequently. This program has been continued successfully, though at a retarded pace during the past 2 years.

In the fiscal year commodity studies were published on arsenic, asbestos, clay, minor mineral-fertilizer materials, sodium sulphate, titanium, and vermiculite; moreover, lacking more direct means of publication, considerable basic information on other commodities was incorporated into Minerals Yearbook chapters. A new chapter on minor nonmetals was added to the yearbook contributions prepared wholly or partly by this division. Supplementing individual commodity studies the division has made several horizontal studies of minerals grouped according to consuming industries. Additions to this service during the fiscal year included a circular on the fertilizer industries, a paper for a national engineering society on the refractories industries, and a trade-journal article on the future of the building-stone industries. As usual, general summaries of the rare-metals and nonmetallic-minerals industries were prepared for the annual review number of Mining and Metallurgy. By request of the editors a chapter was prepared for the milling volume of the American Institute of Mining and Metallurgical Engineers, summarizing current technology for preparing all the leading industrial minerals for market.

The Division maintains and distributes lists of buyers and sellers of rare metals and nonmetals, a service helpful to purchasing agents as well as to those who undertake to develop mining properties. In June the revision and enlargement of these lists were undertaken. The procedure for relieving the specialists of their burden of routine inquiries was improved further. Despite this, however, such routine work and the added responsibility of furnishing data to the various new agencies concerned with mineral products consumed a substantial part of the time of the Division's inadequate staff.

Measurable progress has been made toward short-term forecasting of the demand for various mineral commodities; for example, there seems to be a prospect of forecasting production of phosphate rock a year ahead.

Conclusions.—Reduced personnel and increased responsibilities tended to restrict the outflow of publications from the Division, but

the essential factors for economic planning by industry and the Government were maintained, and facilities for more effective utilization of these stores of information may be speedily reconstructed.

COMMON METALS DIVISION

During the year old and new Government agencies increased considerably their requests for services of a consulting nature by the Common Metals Division. A typical example was the assistance given the tin-investigating committee of the House of Representatives. A comprehensive picture of the world tin industry was presented orally to the committee, and special research into the history of tin smelting in the United States and its economic factors was undertaken. In addition, world charts that illustrate strikingly the position of the United States with respect to its supplies of 15 strategic minerals were prepared at the request of the War and Navy Departments. The Division's commodity specialists were consulted frequently by many other agencies, including the Treasury Department, National Recovery Administration, Federal Emergency Relief Administration, Securities Exchange Commission, and Reconstruction Finance Corporation.

Besides serving as a consultant to other Government agencies the Division prepared chapters on 11 major mineral commodities for Minerals Yearbook, 1935. Over 3,000 requests for information were received and answered during the year. The Division's files of fundamental data on the common metals were maintained and expanded. The files, which now contain over 4,000 subject folders covering all economic phases of the metal industries, are invaluable as a source of information.

Work on the many special problems of interest to the industry necessarily has been postponed, due primarily to reduction in the staff. Nevertheless, some attention was given to questions arising from the increased prices of gold and silver, and considerable basic data on long-time trends in metal consumption were assembled. It is hoped that more time can be devoted to economic research of this type as additional personnel is provided.

Conclusions.—At the end of the year the Common Metals Division was merged into the new Metals and Nonmetals Division. Inasmuch as the personnel covering the subjects formerly handled by the Common Metals Division was reduced from 6 to 4 the need for additional employees is most urgent.

PRINCIPAL MINERALOGIST

In consequence of the public interest in minerals the principal mineralogist answered 1,473 letters on 215 subjects during the year;

these had come from every State and from 22 foreign countries. The Bureau is greatly interested in this service, because it makes available to mine operators of limited means essential technical information that they could not afford otherwise.

Chapters on molybdenum, tungsten, radium, uranium, and vanadium, and commercial gases were written for Minerals Yearbook, 1935. The glossary of mining and metallurgical terms published by the Bureau in 1919 is being rewritten and greatly enlarged.

FOREIGN MINERAL SERVICE DIVISION

The supply bill for the Department of the Interior, approved May 9, 1935, authorized transfer from the Bureau of Foreign and Domestic Commerce to the Bureau of Mines of certain activities that justified establishment on July 1 of a Foreign Mineral Service Division. This division is essentially a procurement agency responsible for the collection and compilation of data on foreign mineral production and trade.

Statistics will be collected and compiled throughout the year for publication annually in World Summary of Production and Commerce in Minerals, a reference work designed to supply in concise and handy form a digest of production and trade in minerals for all countries in the world.

A comprehensive bibliographic reference file is being maintained covering foreign mineral resources and trade.

The need of all major industrial nations for strategic and deficiency mineral raw materials, coupled with the fact that few countries are self-sufficient in their domestic reserves of such minerals, indicates the desirability of periodic studies of international flow of these commodities. It is manifest that the competitive position of the principal manufacturing countries is affected by all factors that tend to divert the normal movement of essential raw materials. Recommendations have been made by the National Resources Board, the Science Advisory Board, the War Department, and the Navy Department that the Bureau of Mines make periodic presentation in chart form of the international flow of the principal minerals of commerce. One series of such charts has been prepared during the past year. It is expected that this series will be revised every 2 or 3 years.

HEALTH AND SAFETY BRANCH

SAFETY DIVISION

During the fiscal year 1935 the Safety Division comprised 62 persons, including 24 engineers, 22 safety instructors, 12 clerks, 3 cooks, and 1 laborer. Members of the division assigned to field duty were distributed among the 10 safety stations (Berkeley, Calif.; Birmingham, Ala.; Jellico, Tenn.; McAlester, Okla.; Norton, Va.; Pittsburgh, Pa.; Salt Lake City, Utah; Seattle, Wash.; Vincennes, Ind.; and Wilkes-Barre, Pa.), the 2 field offices (Denver, Colo., and Duluth, Minn.), and the 2 mine safety cars in active service, 1 in the Pennsylvania anthracite region and 1 in West Virginia and Kentucky. A few field safety instructors had no definite headquarters but went from place to place on request, giving safety courses to employees of the mining and allied industries. Eight of the Bureau's 10 all-steel railroad mine safety cars were held inactive on sidetracks through the year because of insufficient funds to operate them—4 at Pittsburgh, Pa.; 1 at Salt Lake City, Utah; 1 at Denver, Colo.; and (during part of the year) 1 at Norton, Va. All these cars have been exposed to deterioration by the weather since July 1, 1933. However, in the spring of 1935, 5 cars were placed in a new storage building at Pittsburgh, so that at present only 3 cars are in "dead storage" on sidetracks.

The field activities of the Safety Division consist chiefly of work for the mining industry, giving training in first aid, mine rescue, and accident prevention, making safety inspections and reports, attending mine-safety meetings, and assisting on request after mine fires and explosions. Nearly all this work demands rapid transportation to and from mines and mining plants, and for this purpose 37 motor vehicles—including 18 trucks—were in use and were driven 528,620 miles in the fiscal year.

Training courses.—Persons competent to judge agree that a full course in first-aid training to every person in a mining organization probably is the most effective present-day means of arousing safety consciousness in the workers. It is believed that at least 200 lives are saved and probably as many as 25,000 lost-time nonfatal accidents forestalled each year as a direct result of Safety Division courses. During the past fiscal year 75,809 persons in the industries were given the full Bureau of Mines first-aid course and 1,401 the complete mine-rescue course (instruction in the use of oxygen breathing apparatus, gas masks, etc.), 20,482 more than in 1934 but far short of the record of 112,220 trained in the fiscal year 1931, before allotments for this work were reduced so drastically. The occupational distri-

bution of the persons trained in 1935 was: Coal mining, 52,476; metal mining, 10,265; petroleum industry, 5,977; metallurgical industry, 2,255; nonmetallic mining, 1,904; tunneling, 1,225; cement industry, 376; public utilities, 282; miscellaneous, 2,450. The training was conducted in 484 communities in 35 States. Bureau of Mines personnel also attended 51 first-aid and mine-rescue meetings or contests in 16 States, usually acting as judges. The demands for such work are far greater than the Bureau's present personnel can satisfy.

The Bureau's safety engineers have devised an accident-prevention course for bituminous-coal mining, a more advanced, more technical, and more direct approach to mine safety than the first-aid or mine-rescue courses. This advanced course is suitable for only the more intelligent workers, but has proved invaluable to mine bosses. The course was started in 1930 and to July 1, 1935, had been taken by 8,851 persons; here again the demand exceeds the supply of instructors. During the past year 1,211 bituminous-coal-mine officials and other workers in 8 States took the full course, which requires attendance at about 20 meetings. About 10 members of the Safety Division devote much of their time to this important work, and three or four times as many could be given full-time duty on it, as this high type of safety education should be extended to the metal-mining, quarrying, cement, and petroleum industries, with experienced personnel as instructors.

Much first-aid training is now done in cooperation with the industry; the Bureau safety instructor conducts an intensive course of first-aid training for selected keymen of the mining company, who then divide the company's personnel into squads or classes of about 25 men each and give them the first-aid course, with the Bureau of Mines safety man as supervisor. Keymen with suitable qualifications, who have acted as temporary instructors, are recommended by the Bureau representative to receive temporary certificates as Bureau of Mines first-aid instructors; these are made permanent if the recipients do certain prescribed first-aid work each year for 5 years. In the last fiscal year 1,132 of these temporary or annual first-aid instructors' certificates were issued in 26 States, and 716 certificates previously issued were renewed. To June 30, 1935, the Bureau had distributed 5,699 first-aid instructors' certificates. They are much desired, because holders frequently have benefited by being given preferential rank and higher pay or have obtained fairly responsible positions in other industries than mining.

Holmes safety chapters.—To promote safety in mines and mining communities the Bureau sponsors the formation of community safety organizations called "Holmes safety chapters", named for its first director, Joseph A. Holmes. During the fiscal year the Safety

Division organized 68 new Holmes chapters in 7 States with an aggregate membership of over 18,000 persons. To the end of the fiscal year, 433 chapters had been organized in 29 States. Bureau of Mines personnel attended 448 meetings of safety chapters during the year and prepared and distributed to them a series of mimeographed safety lectures in popular, nontechnical language, which described the principal causes of accidents and available methods of prevention.

Safety meetings.—Attendance at mine-safety gatherings is an important duty of Safety Division engineers. In the past year 962 safety meetings in 28 States, with a total attendance of about 157,000, were included on the schedule of the division's safety men. The Bureau men addressed these gatherings on their work and in turn received information on mine safety.

Safety inspections.—Safety inspections of mines or plants associated with the mining industry constitute another important phase of Safety Division activity. In 1935, 173 such inspections and reports were made in 23 States, and in 11 States 22 confidential written reports were submitted to the operating companies with suitable recommendations for improvement in safety. In consequence of these inspections and reports, hundreds of improvements, some of them very important, are made annually in and around mines to promote greater safety of operation.

Publications.—Seventy manuscripts on various topics within the division's field were prepared for publication during the year; 50 of these were published, chiefly in mimeographed form, in the proceedings of mining and other societies, or in the technical press. All available printing funds for the division were used for reprinting the First-Aid Manual; even so the supply of this textbook needed for the division's field work was far from sufficient. To date 36 editions of the manual, totaling 1,016,525 copies, have been issued.

Although the Health Division was recessed in July 1933 because of drastic curtailment of funds, hundreds of inquiries on health in connection with the mining industry have been received and answered annually, and in addition publications have been prepared for issuance both by the Bureau and the technical press on health subjects, particularly dust diseases. These publications have been so popular that the normal number of copies could not supply the demand.

Conclusions.—Safety in the mining and related industries has improved greatly in the past few years. The training courses given nearly 900,000 persons in those industries are thus earning substantial dividends. For example, in coal mining the fatality rate in 1933 and 1934 was much lower than in any other calendar year, in

the history of the industry. Moreover, instead of nearly a score of major explosion disasters annually in the coal mines the total was 1 in 1933, 2 in 1934, and 2 to July 15, 1935. The employees of the Safety Division make personal contacts each year with 300,000 to 500,000 persons in the mining industry, bringing to them directly the safety teachings of the Bureau and thus helping to increase safety in the production of our minerals.

DEMOGRAPHICAL DIVISION

The Demographical Division conducted statistical investigations to determine the number and cause of accidents to employees in United States mineral industries, the relation between frequency and severity of accidents, the quantity of minerals produced, and the number of men employed. Information of this kind is required as a basis for accident prevention and as a measure of progress in safeguarding miners' lives. Such data are furnished to mining companies and others interested in preventing accidents.

The outstanding fact revealed by investigations during the calendar year 1934, which were based upon reports from representative plants in all parts of the country, was general reduction in accident rates for most branches of mining, notwithstanding increased tonnages mined. Although complete data for the year are not yet available, it is believed that final returns will confirm the showing forecast by reports already examined.

Iron-ore mines.—A notable increase in the number of men employed at the mines and in the quantity of ore produced was accompanied by a decreased accident rate. There was, however, a slight reduction in the quantity of ore mined per man-hour of labor. The number of workdays per man increased.

Copper mines.—A marked reduction in the accident rate was effected by copper-mining companies, although the tonnage of ore mined, the number of men employed, and the total man-hours of employment were larger than in the previous year. Productivity per man-hour increased slightly.

Gold, silver, and miscellaneous metal mines.—Increased tonnage of ore mined, a larger number of employees, and an increase in the aggregate number of man-hours worked at mines of this class unfortunately were accompanied by an increased accident rate. Productivity per man-hour increased slightly.

Lead and zinc mines.—More men were employed, more ore was mined, and a material increase was made in the total number of man-hours worked. Productivity per man-hour and accident rate both increased.

Cement mills and quarries.—This branch of the mineral industry consistently maintains low accident rates from year to year. The rate for 1934, though low compared with other industries, was slightly higher than in 1933. Total production and productivity per man-hour of labor both increased. The number of employees was somewhat larger than in 1933, and the total man-hours of employment increased.

Other quarrying.—Quarrying and other related work, such as rock-dressing, crushing, and the manufacture of lime, reduced their accident rate slightly in 1934; a larger tonnage of rock was produced and a larger number of men employed than in 1933. Productivity per man-hour declined slightly.

Accident-prevention contest.—A safety contest conducted among 334 mines and quarries in 38 States showed that safety had progressed so far in a number of States that accidents were eliminated. Through the accident reports furnished by the competing companies the Bureau obtains a fund of reliable information required in studying causes of accidents at mines and quarries, the frequency and severity of such accidents, and means whereby accidents may be prevented.

Explosives.—During 1934, 39,207,845 pounds of permissible explosives, 206,625,027 pounds of high explosives other than permissibles, and 68,935,050 pounds of black blasting powder were produced in the United States. The mineral industries consumed 65 percent of the total.

Conclusions.—Due to insufficient funds, the division cannot compile and make available to the industry adequately the vital facts concerning causes and frequency of accidents, such as might be obtained from the accident and employment reports furnished regularly by mining companies. The recommendation made a year ago is repeated, namely, that additional trained personnel should be obtained to enable the division to supply the mining industry with a larger measure of the information that may be obtained from the reports the operating companies furnish to the Bureau for its general study of accidents.

Effective July 1, 1935, the duties and personnel of the Demographical Division were transferred, by order of the Director, from the Health and Safety Branch to the Economics and Statistics Branch.

ADMINISTRATIVE BRANCH

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, and general administrative routine.

Personnel.—On June 30, 1935, there were 523 full-time employees on duty at the Bureau. The employees were distributed and classified as shown in the following table:

	Classification and number of employees				
	Profes- sional	Subprofes- sional ¹	C. A. F.	Custodial ²	Total
Washington.....	³ 36	4	133	6	179
Pittsburgh.....	⁴ 59	30	37	47	173
Field in general.....	⁵ 92	20	35	24	171
Total.....	⁶ 187	54	205	77	523

¹ Includes instrument makers, safety instructors, laboratory aids, assistants, etc.

² Includes janitors, laborers, messengers, etc.

³ Engineers, 19; chemist, 1; miscellaneous, 16; total, 36.

⁴ Engineers, 30; chemists, 21; miscellaneous, 8; total, 59.

⁵ Engineers, 43; chemists, 26; miscellaneous, 23; total, 92.

⁶ Total: Engineers, 92; chemists, 48; miscellaneous, 47; grand total, 187.

In addition to the foregoing full-time employees the following persons were engaged on a when-actually-employed basis: 7 laborers, etc., employed on field agreements; 1 consulting metallurgist; 29 consulting engineers (Advisory Board); and 52 other employees holding classified, unclassified, and excepted appointments on a part-time basis, making a total of 612 employees.

Property.—The property records of the Bureau, as of June 30, 1935, show accounts as follows:

Automobiles and trucks.....	\$74, 762. 45
Canvas and leather goods.....	3, 498. 10
Drafting and engineering instruments.....	10, 061. 92
Electrical equipment.....	62, 492. 72
Hardware and tools.....	31, 683. 23
Household equipment.....	19, 016. 99
Laboratory apparatus.....	467, 645. 30
Medical equipment.....	8, 202. 66
Office furniture and equipment.....	297, 589. 90
Photographic apparatus.....	28, 786. 29
Machinery and power-plant equipment.....	1, 005, 787. 19
Land, buildings, and improvements.....	1, 523, 430. 92
Rescue cars and specialized apparatus.....	403, 014. 92
Total.....	3, 935, 972. 59

This property is located in Washington and at the various field stations and offices of the Bureau.

INFORMATION DIVISION

The Information Division comprises five sections concerned with dissemination of information on the Bureau's investigations.

Publications.—During the past year the publications section supervised the distribution of 100,234 copies of the free editions of printed

Bureau publications and approximately 330,000 reports of investigations, information circulars, and monographs. These were sent, however, only as the result of a direct request either for a specific publication or for all publications on a particular subject. In addition, the Superintendent of Documents sold about 100,000 copies of the Bureau's printed reports.

Numerous brief statements announcing the issuance of new publications or describing current investigations were supplied to the daily and technical press. These short items were printed widely and effectively acquainted the public with the results of the Bureau's work.

The section handled more than 61,350 letters requesting publications or information regarding the Bureau's activities and general mining subjects.

Editorial.—During the fiscal year 8 bulletins, 7 technical papers, 1 economics paper, 72 Minerals Yearbook and Minerals Yearbook Appendix separate chapters (1934 edition), and 4 miscellaneous papers—a total of 92 printed publications—were edited and sent to the printer. Moreover, during the year 71 chapters for Minerals Yearbook, 1935, which was sent to the printer soon after July 1, were edited. Owing to lack of printing funds, however, only part of the Bureau's output could be published in this manner; consequently, 157 papers (compared with 115 in 1934) were submitted for publication in the technical and trade press.

The section also edited 28 reports of investigations and 69 information circulars—papers which supply promptly to the mining industry and the general public the essential results of Bureau investigations usually described in detail in later printed reports or which present salient facts on the mineral industries in concise form suitable for use in reply to queries.

Motion-picture production.—As a means of disseminating information regarding safety and efficiency in the mineral industries the Bureau maintains what is perhaps the largest library of motion-picture films in the world. These films, prepared under supervision of the Information Division through the cooperation of industrial concerns which bear the entire cost of production, show where essential minerals are found and how they are mined, manufactured, or refined into useful products, utilized, and conserved. The prevention of accidents and the protection of human life have been given special attention, and several pictures deal specifically with these important subjects.

During the past year 5 film subjects were revised, and 522 additional reels obtained for circulation.

Library.—The year's accessions to the library comprised 3,770 books and pamphlets; 300 periodicals were received currently; and 6,442 books were loaned for use outside the library.

Graphic section.—In addition to drafting and photographic service the graphic section circulates the Bureau's films. This work is centralized at the Pittsburgh Experiment Station, but there are 11 sub-distribution centers throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but exhibitors are asked to pay transportation charges. On June 30, 1935, the Bureau had 1,368 sets of films, including 2,771 reels, aggregating 1,789,990 feet. During the year the films were shown on 61,002 occasions before an estimated audience of 4,970,010. The number of showings and attendance were both 22 percent higher than in the last fiscal year.

Conclusions.—The Information Division, as the outlet through which the results of the Bureau's scientific investigations are made available to the mining industry and to the general public, rendered valuable and efficient service during the year in editing more than 410 manuscripts, distributing over 430,200 publications, revising and circulating educational motion-picture films, answering letters and inquiries, and preparing statements widely printed in the daily, trade, and technical press.

Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910. Table 2 gives a statement of the distribution of congressional appropriations to the branches and divisions within the Bureau and the expenditure of these funds in 1935, by Bureau divisions.

TABLE 1.—Bureau of Mines appropriations and expenditures, fiscal years ended June 30, 1911–35

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments ¹	Funds transferred from other departments ²	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items ³
1911.....	\$502,200.00	\$34,200.00	-----	\$536,400.00	\$22,818.27	\$513,581.73	\$513,581.73
1912.....	475,500.00	45,640.00	-----	521,140.00	6,239.77	514,900.23	514,900.23
1913.....	583,100.00	47,850.00	-----	630,950.00	4,087.20	626,862.80	626,862.80
1914.....	664,000.00	57,307.79	-----	721,207.79	4,678.29	716,629.50	716,629.50
1915.....	760,000.00	55,424.60	-----	785,924.60	4,178.11	781,746.49	781,746.49
1916.....	757,300.00	48,710.87	-----	806,010.87	9,058.63	796,952.24	796,952.24
1917.....	981,060.00	52,400.00	-----	1,033,460.00	48,588.10	984,871.90	984,871.90
1918.....	1,467,070.00	51,901.98	\$3,062,000.00	4,580,971.98	395,745.10	4,185,226.88	1,172,939.64
1919.....	\$3,245,285.00	49,542.86	\$8,600,000.00	11,894,827.86	2,452,236.78	9,442,591.08	1,137,471.37
1920.....	1,216,897.00	52,800.00	-----	1,269,697.00	9,592.18	1,260,104.82	1,245,891.36
1921.....	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922.....	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923.....	1,580,900.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924.....	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925.....	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926.....	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927.....	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928.....	3,025,150.00	113,266.45	328,000.00	3,466,416.45	7,736,235.62	2,730,180.83	1,997,270.66
1929.....	2,725,118.00	103,000.00	205,500.00	3,753,094.67	⁸ 152,701.34	3,600,393.33	2,280,960.68
1930.....	2,274,670.00	123,300.00	166,200.00	⁸ 2,664,386.38	⁹ 135,714.93	2,548,671.45	2,216,995.72
1931.....	2,745,060.00	120,680.91	166,500.00	¹⁰ 3,134,595.10	¹⁰ 195,534.37	2,939,060.73	2,304,121.45
1932.....	2,278,765.00	137,866.48	194,500.00	¹⁰ 2,770,712.18	¹¹ 344,689.43	2,426,022.75	2,186,799.92
1933.....	1,860,325.00	75,100.00	184,000.00	¹¹ 2,398,947.38	¹² 488,335.34	1,910,612.04	1,710,949.42
1934.....	1,574,300.00	50,230.00	17,000.00	¹² 1,890,171.98	¹³ 408,674.26	1,481,497.72	1,254,846.72
1935.....	1,293,959.07	50,000.00	126,513.10	¹³ 1,546,989.94	¹⁴ 35,942.18	1,511,047.76	1,349,764.55
Total.....	40,420,738.07	1,746,028.35	15,416,020.11	59,289,396.60	5,751,707.02	53,537,689.58	35,901,889.10
1936.....	1,994,011.00	72,000.00	20,000.00	¹⁵ 2,113,011.00	-----	-----	2,048,011.00

¹ Includes printing and binding, stationery, and contingent funds.² Includes proceeds from sales of residue gas.³ Service items include Government fuel yards, helium, and other investigations and services for other departments.⁴ Includes gas investigations for War Department.⁵ Includes \$1,586,388 for Government fuel yards.⁶ Includes War Minerals Relief Commission \$8,500,000.⁷ Includes \$719,476.67 unexpended balance reappropriated.⁸ Includes \$120,216.38 unexpended balance reappropriated.⁹ Includes \$102,354.19 unexpended balance reappropriated.¹⁰ Includes \$159,580.70 unexpended balance reappropriated.¹¹ Includes \$214,713.96 unexpended balance reappropriated.¹² Includes \$184,056.04 unexpended balance reappropriated.¹³ Includes \$50,000 unexpended balance reappropriated.¹⁴ Includes \$27,000 unexpended balance reappropriated.¹⁵ Estimated.

TABLE 2.—Bureau of Mines expenditures, fiscal year 1935

Branch or division	General expenses	Operating rescue cars and stations and investigation of accidents	Mining investigations in Alaska	Testing fuel	Mineral mining investigations	Oil and gas investigations	Expenses, mining experiment stations	Care, etc., buildings, and grounds
Office of the Director.....	\$10,999.22							
Office of the Assistant to the Director.....	9,051.55							
Administrative Branch:								
Office Administration Division.....	24,712.86	\$16,846.31			\$1,133.04			
Information Division.....	6,331.37	15,738.59	\$410.50	\$6,328.12	6,725.53	\$7,175.33	\$8,352.44	\$3,910.00
Total.....	31,044.23	32,604.90	410.50	6,328.12	7,858.57	7,175.33	8,352.44	3,910.00
Office of Chief Mining Engineer.....		25,689.02						
Technologic Branch:								
Experiment Stations Division.....	2	119,539.45		53,309.31	4,909.68		66,201.88	61,317.38
Explosives Division.....		23,166.90						
Mechanical Division.....		37,350.99	6,156.08	44,699.85	672.50			
Metallurgical Division.....					43,842.70		60,662.79	
Mining Division.....					33,862.08			
Petroleum and Natural-Gas Division.....						111,529.70		
Total.....		180,097.34	6,156.08	98,009.16	83,286.96	111,529.70	126,864.67	61,317.38
Economics Branch:								
Coal Division.....								
Common Metals Division.....								
Mineral Statistics Division.....								
Office of Principal Mineralogist.....								
Petroleum Economics Division.....								
Rare Metals and Nonmetals Division.....								
Total.....								
Health and Safety Branch:								
Demographical Division.....		20,348.07						
Safety Division.....		219,414.07						
Total.....		239,762.14						
Total appropriations.....	51,159.88	478,542.20	6,601.61	104,414.20	91,248.27	118,820.06	135,335.40	65,302.16
Total expenditures.....	51,095.00	478,153.40	6,566.58	104,337.28	91,145.53	118,705.03	135,217.11	65,227.38
Unexpended balance.....	94.88	388.80	35.03	76.92	102.74	115.03	118.29	74.78

Branch or division	Economics of mineral industries	Helium pro- duction	Helium plants	Gas produc- tion	Printing and binding	Department contingent	Special trans- ferred funds	Total
Office of the Director.....	-----	-----	-----	-----	-----	-----	-----	\$10,999.22
Office of the Assistant to the Director.....	-----	-----	-----	-----	-----	-----	-----	9,051.55
Administrative Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Office Administration Division.....	\$8,501.56	\$6,904.85	-----	-----	\$9,287.24	\$13,000	-----	80,385.86
Information Division.....	9,508.36	24.75	-----	-----	822.05	-----	-----	65,347.04
Total.....	18,009.92	6,929.60	-----	-----	10,109.29	13,000	-----	145,732.90
Office of Chief Mining Engineer.....	-----	-----	-----	-----	-----	-----	-----	25,689.02
Technologic Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Experiment Stations Division.....	-----	-----	-----	-----	1,066.75	-----	-----	306,344.45
Explosives Division.....	-----	-----	-----	-----	72.93	-----	-----	23,239.83
Mechanical Division.....	-----	-----	-----	-----	1,213.90	-----	-----	90,133.32
Metallurgical Division.....	-----	-----	-----	-----	1,543.40	-----	-----	106,048.89
Mining Division.....	-----	-----	-----	-----	2,201.00	-----	-----	36,063.08
Petroleum and Natural-Gas Division.....	-----	80,483.50	\$49,919.22	\$23,950.89	1,226.10	-----	\$4,048.03	271,157.44
Total.....	-----	80,483.50	49,919.22	23,950.89	7,324.08	-----	4,048.03	832,987.01
Economics Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Coal Division.....	49,491.10	-----	-----	-----	-----	-----	-----	49,491.10
Common Metals Division.....	20,279.13	-----	-----	-----	-----	-----	2,995.12	23,274.25
Mineral Statistics Division.....	92,268.53	-----	-----	-----	13,625.62	-----	-----	105,894.15
Office of Principal Mineralogist.....	7,032.55	-----	-----	-----	-----	-----	-----	7,032.55
Petroleum Economics Division.....	32,522.25	-----	-----	-----	247.54	-----	-----	32,522.25
Rare Metals and Nonmetals Division.....	22,670.61	-----	-----	-----	-----	-----	-----	22,918.15
Total.....	224,264.17	-----	-----	-----	13,873.16	-----	2,995.12	241,132.45
Health and Safety Branch:	-----	-----	-----	-----	-----	-----	-----	-----
Demographical Division.....	-----	-----	-----	-----	1,762.09	-----	-----	22,110.16
Safety Division.....	-----	-----	-----	-----	3,931.38	-----	-----	223,345.45
Total.....	-----	-----	-----	-----	5,693.47	-----	-----	245,455.61
Total appropriations.....	242,505.29	114,413.10	50,000.00	26,517.77	37,000.00	13,000	12,100.00	1,546,989.94
Total expenditures.....	242,274.09	87,413.10	49,919.22	23,950.89	37,000.00	13,000	7,043.15	1,511,047.76
Unexpended balance.....	231.20	127,000.00	80.78	2,566.88	-----	-----	5,056.85	35,942.18

¹ Reappropriated for expenditure in 1936.

The following table covers expenditures by the Bureau of Mines to June 30, 1935, from allotments from National Industrial Recovery and Public Works appropriations:

Project no.	Description	Allotment	Balance	Expenditure
1	Repair mine rescue station, McAlester, Okla.....	\$1,000		\$1,000.00
2	Plans for building for experiment station, College Park, Md.....	16,800		16,800.00
3	Buildings and grounds, Pittsburgh and Bruceton, Pa.....	172,000	\$4.48	171,995.52
4	Roads, Pittsburgh and Bruceton.....	13,000	1.16	12,998.84
5	Repairs to experimental mine.....	15,000	.17	14,999.83
6	Repairs to building and equipment, Bartlesville Experiment Station.....	45,000	.52	44,999.48
7	Paving Bartlesville Experiment Station.....	10,000	3.75	9,996.25
8	Building and equipment, experiment station, Tuscaloosa.....	200,000	177,768.87	22,231.13
9	Locating underground water resources in Nevada.....	4,950	4,110.27	839.73
	Total.....	477,750	181,889.22	295,860.78

ST. ELIZABETHS HOSPITAL

(WILLIAM A. WHITE, M. D., Superintendent)

MOVEMENT OF POPULATION

On June 30, 1935, 5,315 patients remained in the hospital as compared with 5,191 on June 30, 1934, an increase of 124.

The total number of patients under treatment during the year was 6,015, as compared with 5,875 for the preceding year, an increase of 140.

The total number of admissions during the year was 824, as compared with 894 the preceding year, a decrease of 70.

The total number of discharges for the year was 396, as compared with 426 for the preceding year, a decrease of 30.

The total number of deaths for the year was 304, as compared with 258 for the preceding year, an increase of 46, or about 18 percent.

The total number of discharges and deaths, combined, was 700, compared with 684 for the preceding year, an increase of 16, or about 2½ percent.

There were 64 burials in the hospital cemetery, as compared with 57 the preceding year, an increase of 7. With the cooperation of the War Department the bodies of 36 service men, honorably discharged, were buried in the Arlington National Cemetery, several as "indigent" who had no estate whatever. The other 268 bodies were buried by private undertakers, in cemeteries in Washington and elsewhere throughout the United States, one having been shipped to England.

The daily average patient population was 5,266.5, as compared with 5,049 the preceding year, an increase of 217.5.

Movement of patient population, fiscal year 1935

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1934.....	2,671	747	3,418	1,088	685	1,773	5,191
Admitted during year ended June 30, 1935.	385	137	522	202	100	302	824
Total number under care and treatment during year ended June 30, 1935.....	3,056	884	3,940	1,290	785	2,075	6,015

Movement of patient population, fiscal year 1935—Continued

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Discharged as—							
Not insane.....	10	3	13	3	0	3	16
Recovered.....	85	14	99	34	13	47	146
Improved.....	70	10	80	19	9	28	108
Unimproved.....	79	21	100	22	4	26	126
Total discharged.....	244	48	292	78	26	104	396
Died.....	118	51	169	79	56	135	304
Total of patients discharged and died.....	362	99	461	157	82	239	700
Number of patients remaining on rolls June 30, 1935.....	2, 694	785	3, 479	1, 133	703	1, 836	5, 315

ADMINISTRATIVE DEPARTMENT

OFFICE OF THE ASSISTANT TO THE SUPERINTENDENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products such as potatoes, tomatoes, beans, parsley, spinach, squash, turnips, etc., were 265,311 gallons of milk, 156,411 pounds of fresh pork, 14,742 dozen eggs, 6,336 pounds of chicken, 23,970 bunches beets, 20,670 bunches carrots, 5,700 bunches endives, 14,600 bunches green onions, 8,800 bunches parsley, 28,200 bunches radishes, 211 bunches asparagus, 81 bushels apples, 1,450 bushels cabbage, 50 bushels cabbage cuttings, 511 bushels carrots, 122 bushels cucumbers, 106 bushels eggplant, 3,565 bushels kale, 877 bushels mustard, 489 bushels parsnips, 87 bushels pears, 274 bushels green peppers, 845 bushels sweetpotatoes, 1,745 bushels rape, 129 bushels rutabagas, 1,525 bushels turnips, 967 bushels spinach, 27,000 ears of green corn, 1,500 pumpkins, 1,800 squash, etc., 12,500 pairs of shoes and slippers, 5,812 brooms, 2,089 brushes, 2,150 men's belts, 3,800 pairs of suspenders, 2,179 mattresses, 1,800 pillows, 850,000 loaves of bread, 3,265,000 rolls, 90,000 pounds of pastry, 22,000 gallons ice cream, and the laundering of 11,295,000 articles, in addition to hundreds of other items.

Amongst the items raised on the farm, in addition to the garden products, were 940 tons of ensilage corn, 127 tons of alfalfa hay, 54 tons of sudan grass and soybean hay, 100 tons of wheat-green, and 2,300 bushels of field corn.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops, and articles of clothes, bed linen, tableware, all boots, shoes, and other leather goods were repaired. The patients on the wards, under the direction of occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, and assisted in making stand covers, table covers, tablecloths, towels, and other items.

All the steam, electricity, ice, and refrigeration used on the reservation was manufactured in the hospital shops.

Dairy and cow barn.—The Holstein-Friesian herd has again been tested for tuberculosis, and one cow reacted; this cow was sold in January. No lesions were found post-mortem. The herd is evidently free of tuberculosis. The herd consists of 233 cows, 94 heifers, 82 calves, and 8 bulls, a total of 417 animals. This is the twenty-first year that there have been practically no reactions from tuberculosis. This is one of the largest accredited herds in the country.

Bang abortion disease found in May 1934 continues to be a problem in the herd, though it seems to be under control, as no new cases have developed since December 1934. Blood tests were made on the herd since May 1934 as follows:

May 1934, 380 cows, heifers, and bulls, Bang disease reactors.....	36
June 1934, 255 cows and bulls, Bang disease new reactors.....	2
July 1934, 378 cows, heifers, and bulls, Bang disease new reactors.....	1
August 1934, 195 cows, heifers, and bulls, Bang disease new reactors.....	0
September 1934, 356 cows, heifers, and bulls, Bang disease new reactors---	1
October 1934, 241 cows, heifers, and bulls, Bang disease new reactors.....	1
December 1934, 293 cows, heifers, and bulls, Bang disease new reactors----	0
January 1935, no test made.	
February 1935, 312 cows, heifers, and bulls, Bang disease new reactors----	0

These tests, since May 1934, show that the first blood test practically cleaned the herd, as only five new reactors have occurred since that date and no reactions occurred in either the August, December, or February tests.

Unless something unforeseen occurs, it looks as if Bang disease is under control. Investigations were made by veterinarians of the Bureau of Animal Industry, who spoke favorably of the results of the blood testing, quarantining, and other efforts made on the hospital herd, and stated that they knew of no large herd in which the desired results had occurred so promptly.

The herd produced 265,311 gallons of milk during the past year, about 4 percent less than the previous year. This was an average production of about 12,000 pounds of milk per cow per year.

The quality of the milk, as indicated by the various bacteria counts, has been highly satisfactory, the average, well below 10,000 colonies per cubic centimeter (average about 6,800), being well within the requirements for certified milk.

The hospital continues to cooperate with the United States Department of Agriculture in the use of pure-bred bulls from its Beltsville (Md.) Experimental Station.

Piggery.—The hospital slaughtered 603 hogs during the year, which furnished 156,411 pounds of dressed pork, about 44,000 pounds more than during the previous year.

Farm and Garden.—The past fiscal year has not been marked by any serious disturbing factors, neither have any unusual successes been attained. Some improvements have been made that are not apparent on the surface, the chief item being the maintenance of general production in spite of reductions in both land and labor. As previously reported, this has been done at some sacrifice to general appearance of the farm and premises.

The amount of land available for production is gradually decreasing. No additional land has been purchased for farming purposes since 1891, when the hospital had about 1,200 patients, while it now has 5,300 patients. To house the increased number of patients required more beds and more buildings. Each building reduced the land available for farming. Each building required other utilities—lawns, walks, water, steam pipes, electric lights, etc. All of this reduced the land that could be cultivated for farm and gardening. The time has been reached when something should be done. When St. Elizabeths Hospital was first established it was located some distance away from the center of the city of Washington. The growth of the city has encompassed the hospital. The city that now surrounds the main portion of the institution, and what was formerly rural district is part of the city itself. The cow barns and piggery are located adjacent to Nichols Avenue and close to several of the buildings housing patients. Provision should be made for the purchase of land some distance away from the main portion of the hospital to locate the farm activities. This should include not only land for raising forage, fruits, and vegetables, but also to establish the dairy, piggery, and poultry plant. If about 5,000 acres of land could be purchased, the various items named could be located on the new farm and building erected, providing quarters for about 240 patients, whose services could be used helping to do the work on the farm and we believe such work would be of therapeutic value to the patients.

Diet.—The hospital continues the study of the diet. Not only are efforts being made to serve a greater variety of food to the patients and a larger variety of greens, but even greater efforts are being made to see that the food is being served in a more appetizing manner.

The manner of feeding through cafeteria has been extended. A cafeteria has been opened for the West Lodge dining room, which furnishes food not only for the patients in the West Lodge building but many from the Garfield, Dawes, and Ash wards. Four hundred and sixty patients are served in this cafeteria.

The dining room adjacent to the Detached Building has been equipped for cafeteria feeding, and 596 patients are served in this dining room.

The dining room attached to the S. P. B. group has been equipped for cafeteria service, and 530 patients are served in this dining room.

More than 2,600 patients are now fed by the direct cafeteria system, and 1,000 additional by a modified form of cafeteria system which will best suit the needs of the various patients. That means that about 3,500 out of 5,300 patients at the hospital are fed by the cafeteria system, which permits them to participate in the choosing of the food that they are to eat. The hospital method of furnishing food by cafeteria style is to give the patients an election. The result of this change seems to be appreciated by the patients, who have not hesitated to express their approval of the improvement in the manner in which the food is served.

The cafeteria set aside for employees has been reconditioned, new toilet and locker rooms being provided.

Two classes in dietetics have been taught this year by one of the dietitians. Each class had 13 student nurses. The class consisted of 15 hours of lectures and 30 hours of laboratory work.

Two classes in diet and disease have also been taught by one of the dietitians. There were 15 students in one class and 10 students in the other, these classes consisting each of 15 hours of lecture.

Ice cream and pasteurizing plant.—A total of 263,975 gallons of milk, or a daily average of 723 gallons, were clarified and pasteurized at 148° F., held for 30 minutes, cooled as rapidly as possible to 46° F., and then bottled and canned. The bottles and cans had been thoroughly washed, steamed, and inspected before being used.

About 25 gallons of buttermilk were made daily and bottled and canned.

In the ice-cream department a total of 21,667 gallons of ice cream, or a daily average of 59 gallons, was made.

Bakery.—The output of bread during the year was 850,000 loaves, with 3,275,000 rolls and 90,000 pounds of pastry. During the year a change was made in the ingredients used in the dough by adding powdered milk and malt sirup which, it is believed, has made a great improvement in the output of the bakery.

Laundry.—The work of the laundry continues to increase. The number of pieces laundered during the past year was 11,293,923, about 550,000 increase over the previous year. There has been no increase among the paid employees, notwithstanding the additional number of pieces laundered.

A new disinfecter has been installed, and a larger air compressor is at present being installed.

During the month of April more than 1,000,000 pieces were washed and laundered. We have practically reached the limit of the capac-

ity of the present laundry, and material increase will result in increasing the number of shifts or extending the laundry and purchasing new equipment.

Shoeshop.—During the year the shoeshop manufactured about 10,800 pairs of shoes and slippers; repaired 2,500 pairs of shoes; manufactured all kinds of brushes, numbering 2,113; made 3,189 pairs of suspenders and 2,147 belts.

There is one paid employee in charge of this department, all the other help being patients.

There was a slight reduction in the number of shoes made, but there were sufficient to meet all requirements.

Lawns and grounds.—The topsoil near the male receiving building was regraded and sown with grass seed. Trees were planted adjacent to this building. Shade and ornamental trees were planted near the continued-treatment buildings. In front of tuberculosis building no. 1 dwarf trees were planted so as to give a pleasing effect without cutting off the light from the windows.

Fires.—There were 27 fires during the past year, the total property damage being \$113. Fire inspections and fire drills are regularly made. During the past year the Federal Fire Council made a very exhaustive inspection of the entire institution and in their report, which has just been received, there are some recommendations which will require early action. They commented upon the favorable condition in which the institution is kept and the work done by the hospital fire department, which resulted in a minimum amount of damage by fire.

Construction.—Installed window grilles, metal windows and concrete window sills for all windows on West Lodge porch. Also, window grilles, metal windows and concrete window sills on Oaks-A porch, south side. Extended this porch on west side of Oaks-A, two floors complete, in keeping with the renovation authorized by allotment from the Public Works Administration.

Made a complete overhaul of railroad track and sidings. Changed the location of track along the old cemetery to reduce the curves and improve the grade.

Built a new underground brine line for the cold-storage rooms in the general storeroom from the ice plant to storeroom.

P building was vacated by male patients and is now used by female patients. Renovated this entire building, putting in new floors, pointing up plaster, painting, additional radiators, and changing the plumbing. Laid tile floors in all toilets and bathrooms and quarry tile floors in serving room. Enlarged and improved the pasteurizing room of the dairy. Laid new tile floor, plastered walls and ceiling, and painted the dairy.

Renovated J building. Repaired floors, laid tile floors in bath and toilet rooms.

Erected a sun parlor for Q building, provision being made for a hydrotherapy department on the first floor. General repairs were made in Q building. One dormitory and the visiting room received a new wooden floor. All toilets and bathrooms were tiled. Radiator covers were changed. The S. P. B. group of buildings required considerable repairs, resulting in a general reconditioning in order to keep them in a usable state. Installed new concrete floors in bath and toilet rooms, and replaced wooden beams under dormitories and day rooms.

Replaced wooden floors in bakery with reinforced concrete, with quarry tile finish.

Replaced the concrete floor in the old boiler room at the power house. Installed a 12-inch sewer line through the old boiler room and connected same with sewer line in coal pocket. Built a concrete trench through boiler room for an ash pipe; extended this trench through ash pits under boilers.

Laid water mains around female receiving building for domestic and fire service.

Installed new grille work on porches of J, K, I, N, and Q buildings.

Built a fence with gates between continued treatment buildings nos. 1 and 2. Also a similar fence at two places around the S. P. B. buildings. This permits the patients in the continued treatment and S. P. B. buildings to have freedom of the grounds with limited supervision.

The porches of Allison-A building were enclosed, the remodeling permitting these porches to be used for sleeping purposes.

All coal ranges were replaced by gas ranges, and the heating plant in the propagating house, which is a part of the greenhouse, was connected up with the steam plant, practically doing away with the necessity of using anthracite.

Disbursements.—During the year the President in reorganizing all disbursing departments of the Government located in Washington and centralizing all the work in a general disbursing office of the United States, under the Treasury Department, transferred the disbursing of funds for St. Elizabeths Hospital from the hospital proper to the central disbursing office noted. The reorganization took from the hospital the drawing and mailing of checks for payments. The responsibility for such payments and all other work pertaining to the payments, including the examining of accounts, the keeping of the records and accounts for the trust funds, the payment of small cash balances, continues to be the work of the

hospital employees. The change as noted relieved the hospital disbursing agent from such duties and resulted in a change of title from disbursing agent to Chief of Finance and Accounts Division, St. Elizabeths Hospital, and agent cashier of the General Disbursing Office of the Government.

Public Works projects.—All Public Works projects for which funds were allotted have been completed, with the exception of Federal project no. 1, St. Elizabeths Hospital, female receiving building, on which there has been some delay but it is believed now that this building will be completed October 1, 1935.

Supplies.—Orders were placed for supplies during the year amounting to \$916,150. Of this amount, \$761,141 was covered by formal contracts entered into by the hospital directly with contracting parties.

Personnel.—The total number of employees on the hospital rolls June 30, 1935, was 1,556, an increase of 7 employees.

During the year Congress passed an act reestablishing the standard wage scale, restoring salary reductions which have been made for the past several years.

During the year several of the old employees were retired from the service on account of age, including:

Lebanon Griffith.....	Head carpenter.
George R. Baxter.....	Tinner.
Martha Weedon.....	Housekeeper.
Julia A. Henson.....	Laundress.
Pinkey A. Moussard.....	Kitchen helper.

The following were retired on account of disability:

Charles J. Harbaugh.....	Supervisor.
Mary A. O'Brien.....	File clerk.
Walter B. Treackle.....	Assistant supervisor.
Mary M. Thompson.....	Charge psychiatric nurse.
Frank McClure.....	Attendant.
Thomas Lewis.....	Do.
Ola R. Belfield.....	Do.
Charles W. Marmaduke.....	Fire fighter.
John R. Moore.....	Laborer.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year this department furnished work for 929 patients. This work included weaving, sewing, toy making, woodwork, basketry, etc. In the industrial department there were made 21,660 sheets, 10,610 pillow cases, 28,016 towels, and 6,610 dresses. It has been the practice as far as possible that the patients should make their own dresses.

Red Cross.—The Red Cross continued to maintain a hospital unit during the past fiscal year. The psychiatric social workers attached to this unit are primarily concerned in case correspondence and contact work. During the past year that office sent out 3,902 letters and received 4,088 letters concerning patients and their affairs.

The psychiatric case-work staff has continued filing pensions and the referring of other types of claims to the proper authorities for action.

Three thousand and eighty-six tickets of all classes were donated to the Red Cross for the use of St. Elizabeths' patients, about the same number as during the previous year. These tickets covered baseball, football, athletic events of all sorts, moving pictures, etc. There were 77 moving picture shows in Hitchcock Hall, on the hospital reservation. The athletic director has continued the work of organizing, supervising, and assisting the patients to participate in many athletic events.

During the past year service bands have given 23 concerts.

MEDICAL DEPARTMENT

Library.—The library is divided into two parts, primarily that noted as the medical library, and that noted as the patients' library. The total number of volumes in the combined library is about 31,000. There were 60 books added to the medical library during the year. The hospital subscribes to several newspapers and approximately 100 periodicals, magazines, etc. About 150 books were added to the patients' library. There are approximately 3,500 books in constant circulation.

Social-service department.—The work of this department during the past year included training of students from the hospital training school and from the social-service school.

The social service report from July 1, 1934, to June 30, 1935, showed the following:

Number of out-patients on rolls July 1, 1934.....	93
Number of out-patients on rolls June 30, 1935.....	149
Average number on rolls per month.....	122
Number of patients discharged from the rolls.....	45
Number of out-patients under care during the year.....	219

Training school.—Nineteen students graduated in the 3-year course of the training school. Twenty completed their course and will probably receive their diplomas in September 1935. There were in the training school on June 30, 1935, 28 postgraduate students, 26 affiliating students, 18 seniors, 14 juniors, and 10 freshmen.

In September the affiliation with Garfield Hospital was reopened, and in the same month an agreement was made with the Washington

Sanatorium at Takoma Park, Md., to give their male students psychiatry. In March 1935, an affiliation agreement was made with the Georgetown University Hospital.

Affiliations for St. Elizabeths' students are still in effect with Emergency, Sibley, Children's Hospitals, of Washington, D. C., and Bellevue Hospital, of New York City. There is also an affiliation with the Instructive Visiting Nurse Society, of Washington, D. C.

Medical and surgical wards.—Quite an advance was made in the treatment of fractures of the hip by the use of a new style of fracture apparatus. Progress has been made in the treatment of carcinoma through the use of deep therapy X-ray machines.

In addition to his regular duties, the doctor in charge of the anti-luetic clinic has, during the year, cooperated intensively with various of the personnel of the United States Public Health Service in an investigation which has been made into the relative efficiency and accuracy of the various methods used for determining the presence or absence of syphilis by means of blood and spinal fluid serum reaction. The Public Health Service has made a comprehensive report of this work, and its result should be of considerable advantage in the future in the use of this method as an aid to diagnosis.

The service has been cooperating with the experimental laboratory at Walter Reed Hospital in connection with the artificial culture of the malaria organism.

Two full reels of moving pictures were taken this spring, showing the various activities of the medical and surgical service and were exhibited at the meeting of the American Psychiatric Association in May.

The matter of intravenous injection of large quantities of dextrose and salt solution as a therapeutic measure in various types of illnesses, has received considerable attention during the year. This form of therapy has come into general use in recent years and has proved itself very efficient, accomplishing results heretofore not realized.

Men's services.—The new male receiving building was completed and occupied, beginning on August 8, 1934. With the opening of the new building a definite change of policy with reference to transfer of patients to other services was instituted. During the year there has been retained in this service all acute mental cases, including all problem cases even though chronic, with the exception of several patients who have been transferred to the Howard Hall department because of their extremely dangerous tendencies. Problem cases from other services have been transferred back to the male receiving service for special care and attention.

During the year there were 56,608 treatments given in the hydrotherapy room and 1,238 packs given on the ward, in addition to many continuous baths given on the ward.

With the opening of the male receiving building and the transfer of continued treatment building no. 1 to the Richardson group service, P building, formerly used for male patients, was transferred to the women's department for their use. The use of continued-treatment building no. 1 permitted the erecting of a wire fence between continued-treatment buildings nos. 1 and 2, so that the intervening ground would permit more outside activities for the patients in these buildings. Trees have been planted which we hope eventually will result in many shade spots for the patients out on the lawn during the hot season.

The erection of a fence on each end of the S. P. B. group, between the buildings and the fence, permits the use of the enclosure for the patients in these buildings, giving them fresh air which is a decided relief during the hot weather, as the old S. P. B. group of buildings is unusually warm.

Master radios were installed in continued-treatment buildings nos. 1 and 2, with the control in the supervisor's office and loud speakers on each of the four wards of these buildings.

An occupational index was established in part of the hospital during the last year which has helped in increasing the number of patients usefully occupied. A card was maintained for each patient showing the type of occupation, date of assignment to such, date when work was discontinued and the reason for its discontinuance, such as disturbed, sick, on visit, etc. In addition to the occupational index, every charge nurse was requested to furnish the clinical director with a list of patients on that ward, giving the name, case number, and whether employed or idle; if employed, the type of occupation, with some general remarks as to patient's behavior and habits. These lists were gone over with the physician in charge and the clinical director was able to assign a number of idle patients to various occupations.

The rebuilding of the porches on West Lodge building permitted the use of such porches as sitting rooms. The patients are no longer compelled to sit in dark hallways, as was formerly the case. This has diminished the number of minor injuries resulting from disturbances and fights among patients, and has generally served to improve the patients' morale.

The abolishment of small dining rooms through the establishment of cafeteria in West Lodge has given space for 58 additional beds.

The installation of a cafeteria in the detached service dining room was a marked step forward in the feeding of these patients. It was

a surprise to see the large number of patients belonging to the chronic and deteriorated groups who were able to get along with this type of service.

Women's services.—The completion of the new male receiving building and the reconditioning of the porches around Oaks Building have resulted in many changes. As noted, P building, formerly occupied by men, was turned over to the women's services. Q building is to be made into a receiving building for colored women.

The new women's receiving building will be completed during the fiscal year 1936 and the patients in C building, at present used for a receiving service, will be transferred to the new building. This will permit to some extent the relieving of the crowded condition, especially among colored women.

It is hoped that additional funds will be allotted to the hospital for rebuilding of the porches around Oakes-B, D, and E, and erection of additional buildings.

The cement porch in front of B building has been replaced by soil in which grass will be planted. The taking up of this cement has apparently lowered the temperature of the wards and rooms along this section of the building.

The new water section and south porch rebuilt adjacent to Oaks-A were completed in November, and the west porch adjacent to Oaks-A in March. The north porch is now being reconstructed. The changes from more or less of a fire menace to fireproof porches not only give additional room but furnish more protection for the inmates of this building.

Laboratory.—The work of the laboratory continues to increase. A division of electrophysiology has been added to the laboratory to be used in analysis of the action currents of the brain.

Educational.—The hospital continues to cooperate with the various educational institutions around Washington by having members of its staff give lectures to the students in the medical schools.

The teaching work with the George Washington medical students was continued through the year as during the preceding year, with Dr. Lind acceptably substituting for Dr. Lewis in giving a course of lectures to the first year medical students on medical psychology. The Superintendent lectured to the third year students during the winter and spring. Dr. Hall gave a course of clinical lectures on organic psychology at the medical school in the second year. The fourth-year students now have the benefit of Dr. White's lectures during the third year before they make their clinical contacts on the wards of the hospital, and show this by improvement in their interest and quality of work. The fourth-year ward work to the students was conducted with the help of Drs. Silk, Lind, Twombly, and Duval.

Dr. Hall gave two courses of clinical lectures and demonstrations to the University of Maryland students in abnormal psychology.

Dr. Richmond gave lectures to students in the Naval Medical School, George Washington University Medical School, and a group of Child Welfare Workers from the city.

Dr. Karpman gave a course of lectures to students of the Howard University Medical School.

Dr. Campbell gave lectures on gynecology to nurses; Dr. Coyne lectured to nurses on nervous anatomy, and Dr. Twombly gave lectures to the students of the George Washington Medical School, and lectures and clinics were given to the American University students.

NEEDS OF THE HOSPITAL

An estimate of \$1,199,025 for the support, clothing, and treatment of the patients in St. Elizabeths Hospital for the fiscal year ending June 30, 1937, was recommended. This amount was based on 1,825 patients. The hospital at the present time has 5,394 patients. The average for the fiscal year 1935 was 5,267, as compared with 5,049 for the previous year, an increase of 218. The average for the fiscal year 1937, it is estimated, will be 5,570, 176 more than the present number. The 5,570 are divided as follows: 1,825 Federal patients, appropriated under the title of St. Elizabeths Hospital in the Interior Appropriation Act; 3,300 beneficiaries of the District of Columbia, and appropriated for in the District of Columbia Appropriation Act; 110 beneficiaries of the United States Veterans' Administration, and carried in the appropriation of the United States Veterans' Administration; 130 beneficiaries of the United States Public Health Service, and carried in its appropriation; 35 United States Soldiers' Home beneficiaries, and payment for these to be received from that service; 70 beneficiaries of the Bureau of Indian Affairs, to be paid for by transfer from funds appropriated for conservation of health among Indians.

The rate estimated for the care of the patients during 1937 is \$1.80 per capita per day. This is the same as for the present year, notwithstanding the fact that the deductions from the pay roll under the economy act have been entirely restored and the cost of food seems to be increasing. Not only is the cost of food increasing at the present time but the cost of forage, textiles, and other supplies seems to be on the upgrade.

Included in the estimate is \$200,000 that is essential to keep up the repairs and make the necessary improvements to buildings and grounds. The amount allocated for this work for the fiscal year 1936 was \$185,000, but we question whether this will be sufficient to do all the work of this class that should be done during the year. Out of

these repairs will come funds for keeping more than 100 buildings in repair, repair and widen roads and walks, the maintenance of railroad tracks, replacing glass in windows, fixing floors, repairing and doing all other work of this nature.

The hospital continues to grow. The admissions are increasing. There is still a shortage of beds. Seven hundred additional beds should be provided to cover immediate needs. If authority should be given to erect buildings containing 700 beds, and the number of patients admitted continues to increase as for the past several years, there would still be a shortage of several hundred beds properly to house and take care of the patients. In addition to the shortage noted, some provision should be made for replacing the 500 beds in the semipermanent buildings. These buildings were built in 1918 under wartime conditions at a cost of \$156,000, out of an appropriation for construction and equipment of \$200,000. It was estimated that their life would be 15 years; they have now been in use more than 17 years, and are rapidly deteriorating. The cost of maintenance is very high and is increasing each year. The plumbing must be replaced, new floors should be laid, the buildings will have to be re-roofed, and in some cases the foundations and underpinning must be taken out and replaced by new construction.

Considering the additional buildings that have been erected and are being erected, it was necessary to make a survey of the hospital to see if the various utilities can service the new buildings and the additional number of patients. Such survey took into consideration water, steam, electricity, fire protection, roads, walks, transportation, including communication with the various buildings, land for farming, gardening, dairying, and general farm purposes, and other similar necessary items. After making such survey we found, to meet the immediate needs, that it is necessary to ask for an appropriation of \$3,420,510 for the following:

Six continuous treatment buildings, each containing 160 beds, or a total of 960 beds. The hospital erected two of these buildings. At the same time it built a central kitchen constructed in such a manner that additional buildings of the same class could be erected around it and facilities made for connecting dining room to the kitchen and using the kitchen for about 1,500 to 2,000 patients. The form of construction in the continuous treatment buildings, which are fireproof, permits of the greatest elasticity, at a very low rate of cost per bed. The average cost per bed for this class of construction, including preparation of plans and specifications, advertising, superintendent of construction, and equipment would be about \$1,600. These buildings would take up four spaces around the continuous treatment kitchen already built and permit the two other buildings in the same vicinity to house a different class of patients, permitting a better

classification. The total cost of the six buildings, it is estimated, will be \$1,508,000.

Among the needs of the hospital is a chapel for the religious services for the patients. In 1875 a place for a chapel was left on the third floor of the old center building. This chapel can accommodate about 300 patients. It is in a building that has no elevator, and to reach the same it is necessary to climb a narrow stairway, difficult for many of the patients. The hospital has nearly 5,400 patients and it is growing away from the site on which the old center building is located. It is considered advisable to erect a nondenominational chapel on a plot of ground on the east side of Nichols Avenue, with a seating capacity of 1,000 to 1,500, to be used by the various religious denominations having followers among the patients of the hospital. This chapel to have its meeting place on the ground floor and located in a central place will be more accessible to the patients and available to such patients who are feeble or crippled and could hardly attend divine services where it is necessary to climb steps, where no elevator is available. The various chaplains of the hospital have made a recommendation for such an edifice. The estimated cost of this building is \$150,000.

The hospital has recently erected one building to house tubercular patients containing 80 beds. In 1909, \$20,000 was appropriated for erecting five buildings containing 20 beds each, or a total of 100 beds, for the patients of the hospital suffering from tuberculosis. These buildings are of wood frame covered with pebble-dash. They have been in use for about 26 years and it will be necessary shortly to replace them. An appropriation of \$240,000 was recently made to provide 80 beds for white tubercular patients. Additional beds should be provided, including the care of white and colored women and colored men patients. Two buildings of this sort would provide 160 beds, making a total of 240 beds to care for the tubercular patients. It is essential to provide these beds at an early date. It is estimated that they could be provided at a cost of \$495,170.

An estimate is made for additional land for general farm purposes. The hospital consists of four plots of ground, in all about 800 acres. The last land purchased for hospital use was in 1891. At that time the hospital had less than 1,500 patients, and over 600 acres were used for farm and garden purposes. Gradually the population has increased until there are now under treatment 5,400 patients. To take care of these patients new buildings have been erected, gradually decreasing the amount of land available for farm purposes. The hospital while originally isolated some miles from the center of the city, at the present time on account of the growth of the city and the change in the use of forms of traffic is now adjacent to the city and

the center of a growing population. The dairy and the piggery surround buildings occupied by patients. This is undesirable, if not objectionable. One part of the farm, containing about 69 acres, is located about a half a mile from the main site, in what is known as Congress Heights. It has been recommended that a portion of this ground be turned over to the National Capital Park and Planning Commission for playgrounds for children who reside in the vicinity of this ground.

Another part of this land is desired by the District of Columbia for streets and roads. Some parts of the same land have already been taken over by the city for widening streets and cutting through new streets. Another plot of the hospital is about four and a half miles from Washington; a part of it is on low land, sometimes under water. This contains approximately 400 acres of land. The proposed drive under the Crampton Act would bisect this land, materially reducing the amount left available for farm purposes. It is believed desirable to get additional land for the use of the hospital. If 5,000 or 6,000 acres of land could be provided, the hospital could concentrate on farm projects in one place, increase the size of the dairy herd, the piggery, and the poultry plant, build cottages to house about 250 patients, and buildings for the various employees who would work on farm land. The work of the patients on the farm, it is believed, would add to the therapeutic benefits obtained. The hospital would be able to secure sufficient milk for all purposes, increase the quantity of fresh pork products, cured pork products, reducing the quantity of ham, bacon, and shoulder to be purchased, and increase the quantity of poultry products, such as fowl and eggs. It is believed that this land could be purchased and buildings erected at a cost of about \$750,000.

The rapid growth of the hospital, the increase in population, addition to the buildings on the reservation and the number of animals on the farm to be cared for, have outgrown the available water supply. In 1930 the hospital received all of its water from nine wells. The drought of that year lowered the water line so that it became unprofitable to operate them. Connection was made with the District mains, which have been supplying the hospital with all water required. The increase in the number of patients in the hospital and the additional buildings of a greater height than previously in use, demanded a greater supply of water than the District could furnish. It has been necessary to put pumps in several of the new buildings in order to furnish water to the upper floors. The danger line has been reached. In case of outbreak of fire it is questionable whether sufficient water could be furnished for the full operation of the District fire apparatus. An engineer of the Public Works

Administration was detailed by the Secretary of the Interior to make an investigation, and he reports that:

The water supply question at St. Elizabeths Hospital is extremely urgent. The fire protection is wholly inadequate and the demand during the summer months can barely be met by the present arrangement.

Steps should be taken immediately to provide an adequate supply for the hospital.

The same engineer made an estimate that to provide adequate water supply either by sinking a 24-inch well, or by cross-connections with mains, increasing size and elevation of the water tank, and further connection with the District mains could be secured at a probable cost of \$80,000.

St. Elizabeths Hospital occupies land on both sides of Nichols Avenue. Most of the older buildings are on the right hand, or west, side, while the newer buildings are on the left hand, or east, side. In 1903 a subway was erected under Nichols Avenue, connecting both sides of the hospital grounds for more efficient, economic, and safer transportation and traffic between the two sides of the institution. When this subway was built no consideration was given to motor transportation. In addition, the growth of the hospital has resulted in an increase in the number of patients on that part of the institution where the newer buildings are being erected, until at the present time about 2,000 patients are being quartered in such new buildings. Traffic in the subway by patients and employees, also relatives and friends visiting patients, has increased very materially. Motor vehicles cannot pass each other in this subway, and it is dangerous for the patients to go back and forth while vehicles are coming through. The height of this subway is such that it not only prevents loaded trucks of the hospital from coming through, but altogether stops the passage of any fire apparatus. A survey has been made by an engineer of the Public Works Administration, and in his report he stated that it is essential that additional provision be made at an early date. It is suggested that the present subway be used altogether for pedestrian traffic, and a new two-way subway be erected wide enough for two vehicles to pass each other, with a center partition, thus adding to the safety of the patients. It is estimated that \$50,000 would be required for this work.

The kitchen in the basement of the administration group furnishes meals for the patients in the various buildings on each side of the main building. There is a tunnel connecting with two adjacent buildings, but no tunnel connecting the further building, known as "M building", and it is necessary to carry the food upstairs and have patients wheel it to this other building. In wet or cold weather this is undesirable and the food is often cool before it reaches the patients. A connecting tunnel from what is known as "C building",

on the west side of Nichols Avenue, to M building could be erected at a cost not exceeding \$6,000. This would permit the serving of the food while hot and, it is believed, in better condition. The hospital recently installed three 750-horsepower boilers, which were sufficient for its needs at that time. Space was left for an additional boiler that would be required when the new buildings were erected. The growth of the hospital, with the recommendation for additional buildings, will require additional boiler, air compressor, and utility equipment. It is believed that these can be purchased and installed at a cost of \$200,000.

It has been the practice of the hospital to make all of the buildings as near fireproof as possible. A recent survey by the Federal Fire Council called attention to certain wooden porches adjacent to fireproof buildings. To remedy this condition it is desirable to replace these wooden porches with concrete and brick porches, erecting same in such a manner as to become fireproof. In erecting these porches it is desirable to enlarge the space available for patients' recreation. Some of the older buildings have no porches of any sort. Patients whom it is not advisable to take from such buildings get little or no fresh air. It is considered of advantage to place similar porches to use as day rooms for these patients. To replace porches around Allison and Oaks Buildings, and erect new porches for Garfield and Dawes Buildings, it is estimated, would cost about \$83,000.

The additional number of patients, including the buildings to house them, will require additional facilities for all utilities. The work of the laundry has been continually increasing until now it must take care of 1,000,000 pieces each month. Each year additional machines have been purchased until now all room in the present building has been occupied. The growth of the institution will require a further increase in the facilities of the laundry, and to properly take care of the same it will be necessary to erect an addition to this shop. It is estimated that such addition would cost \$16,000.

The present storeroom was built about 1900, when the cold storage for meats and vegetables was installed. There were about 2,000 patients in the hospital at that time, while at the present time there are about 5,400 patients. The amount of food required to be stored has more than doubled. It has been increasingly difficult properly to take care of and protect the food products. It is urgent to provide additional food storage and cold storage. The same condition applies to the other stores and the hospital will soon require a new storeroom, of much larger proportions than the one at present in use. Temporarily to increase the cold storage space in the present storeroom, to meet the immediate difficulties, it is estimated that \$6,000 will be required.

The same explanation given in reference to other utilities applies to the bakery. To provide additional room, including a freight elevator, for the bakery, \$3,500 will be required.

There are about 8 or 10 buildings on the hospital grounds that have local heating arrangements. It is considered economical, as well as more efficient, to connect these building up with the central heating plant. This could be done for \$7,300. The cost of coal saved in a few years would offset this amount.

The additional number of patients require more vehicles for the handling of food, laundry, and for general use of the hospital. The garage when constructed seemed of ample size. It had a small place for repairs. More room is needed to house vehicles and to properly service the hospital machines. A recommendation is made to build and addition to the present garage which, it is estimated, could be done for about \$12,000.

The spray pond, to aerate water for condensing purposes, was constructed about 1912. The remodeling of the power house, with additional boilers, increased the quantity of water used. When the present spray pond has to be repaired or cleaned, it stops all aerating of the water. It is considered essential to have an additional spray pond for the proper operation of the plant, and it is estimated that this could be provided at a cost of \$11,000.

Many of the buildings of the hospital have not been painted in years. This is due to the limited amount of money available for repairs. Unless these buildings are painted at an early date, it is feared that deterioration will take place and require a much larger sum for repairs. It is estimated that \$14,000 would be required to paint R, P, I, M, N, J, K, and L buildings.

The same explanation given in reference to growth of the hospital and the additional facilities required for other purposes, applies to the manufacturing of ice and cold storage. No addition has been made to this department for over 15 years. The present building was formerly used as a boiler house. It was converted into an ice plant and contains one Remington and one York Compressor, with pumps. The plant has reached its capacity in both the manufacturing of ice and furnishing of cold storage. The large quantities of food used require more cold storage, and additional compressor and brine pump required to ice them. An addition to the ice storage room is to house the ice manufactured. If the additional building is erected around the cold storage plant, it will be necessary to build a road for approach. It is estimated that this addition, with machinery and road, could be furnished at a cost of \$19,040.

The storm sewer from the road areas in the vicinity of Hitchcock Hall passes by the power plant. The pipe in a number of places is in bad condition and liable to break under heavy rain. Should this

occur the power plant would be in danger of being flooded, and with the present drainage from the boiler rooms and from the basement of the engine rooms would on failure to remove the water shut down the steam and electric plant. The regrading and draining of coal pockets around the new coal silo, just completed, cut off the former drain pipe in that area; and the water in recent storms was trapped on floors several inches deep before it could flow up through the outlets. It is estimated that the cost of making changes to remove the condition noted would be about \$9,500.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS TO ST. ELIZABETHS HOSPITAL

A bill has been introduced in Congress, upon the recommendation of the District Commissioners, to change the method of admissions to St. Elizabeths Hospital. The hospital cooperated with representatives of the District upon the form of the proposed bill.

STAFF CHANGES JULY 1, 1934, TO JUNE 30, 1935

The following appointments were made during the year:

Junior medical officers (internes): Eugene J. Alexander, Derwood G. Hall, Alfred L. Abrams, Anna R. Coyne, Thomas J. Taylor, J. L. Hoffman, Walther H. Thiele, Maurice Kleinerman, and Stephen S. Kramer, Jr.

The following resignations took effect during the year:

Junior medical officers (internes): Joseph A. Rieger, Elmer Peterson, Jesse F. Casey, Meyer Beber, Alexander Wolf, and Judah Marmer.

Assistant medical officer: Roger S. Cohen.

PUBLICATIONS

White, William A., superintendent:

The frontier of the mind. Journal of the Washington Academy of Sciences. Vol. 25, no. 1, January 15, 1935.

The frontier of the mind. (Read at a joint meeting of the District of Columbia Medical Society and the Washington Academy of Sciences, Washington, D. C., Nov. 21, 1934.) Published in Mental Hygiene, vol. XIX, no. 1, January 1935, pp. 78-94.

Man, The Great Integrator. Science, March 8, 1935, vol. 81, no. 2097, pp. 327-343.

Judicial Versus Administrative Process at the Prosecution Stage. (Delivered at the Attorney General's conference on crime, Washington, Dec. 11, 1934.) Journal of Criminal Law and Criminology. Vol. XXV, no. 6, March-April 1935, pp. 851-858.

The Teaching of Clinical Psychiatry. Reprint from the proceedings of the Second Conference on Psychiatric Education, held in New York City at the Waldorf-Astoria on May 27, 1934, pp. 16-21.

White, William A., superintendent—Continued.

Personality, Psychogenesis and Psychoses. (Lecture delivered at the Pennsylvania School of Social Work, Philadelphia, Pa., Apr. 29, 1935. Privately printed.)

Modern Housing of Mental Patients. (With Monie Sanger.) Published in the Modern Hospital, vol. 45, no. 1, July 1935, pp. 42-47.

Diseases of the Nervous System. (With Dr. S. E. Jelliffe.) (Text book—Sixth edition.) Published by Lea & Febiger, Philadelphia, Pa., 1935, pp. 1175.

Eldridge, Watson W., principal medical officer:

(With Simon, A., and Ramos, R.) Oxycephaly: Report of two cases. American Journal of Roentgenology and Radium Therapy. Vol. 33, no. 4, 1935, pp. 516-521.

Karpman, Benjamin, senior medical officer:

Obsessive paraphilias: Critical review of Stekel's works on sadism, masochism, and fetishism. Archives of Neurology and Psychiatry. Vol. 32, no. 3, September 1934, pp. 577-626.

The individual criminal; studies in the psychogenetics of crime. (Book.) Washington. Nervous and Mental Disease Publishing Co. Pp. 317.

Preliminary to the psychotherapy of criminals. Journal of Criminal Law and Criminology. Vol. 25, no. 6, March-April 1935, pp. 918-927.

Fong, Theodore C., senior medical officer:

Treatment of neurosyphilis. Medical Annals, District of Columbia, vol. 3, no. 8, August 1934, pp. 217-222.

Treatment of neurosyphilis. Journal of Chemotherapy, vol. 9, no. 4, January 1935, pp. 138-143.

Simon, A., assistant medical officer:

(With Eldridge, Watson W., and Ramos, R.) Oxycephaly: Report of two cases. American Journal of Roentgenology and Radium Therapy, vol. 33, no. 4, April 1933, pp. 516-521.

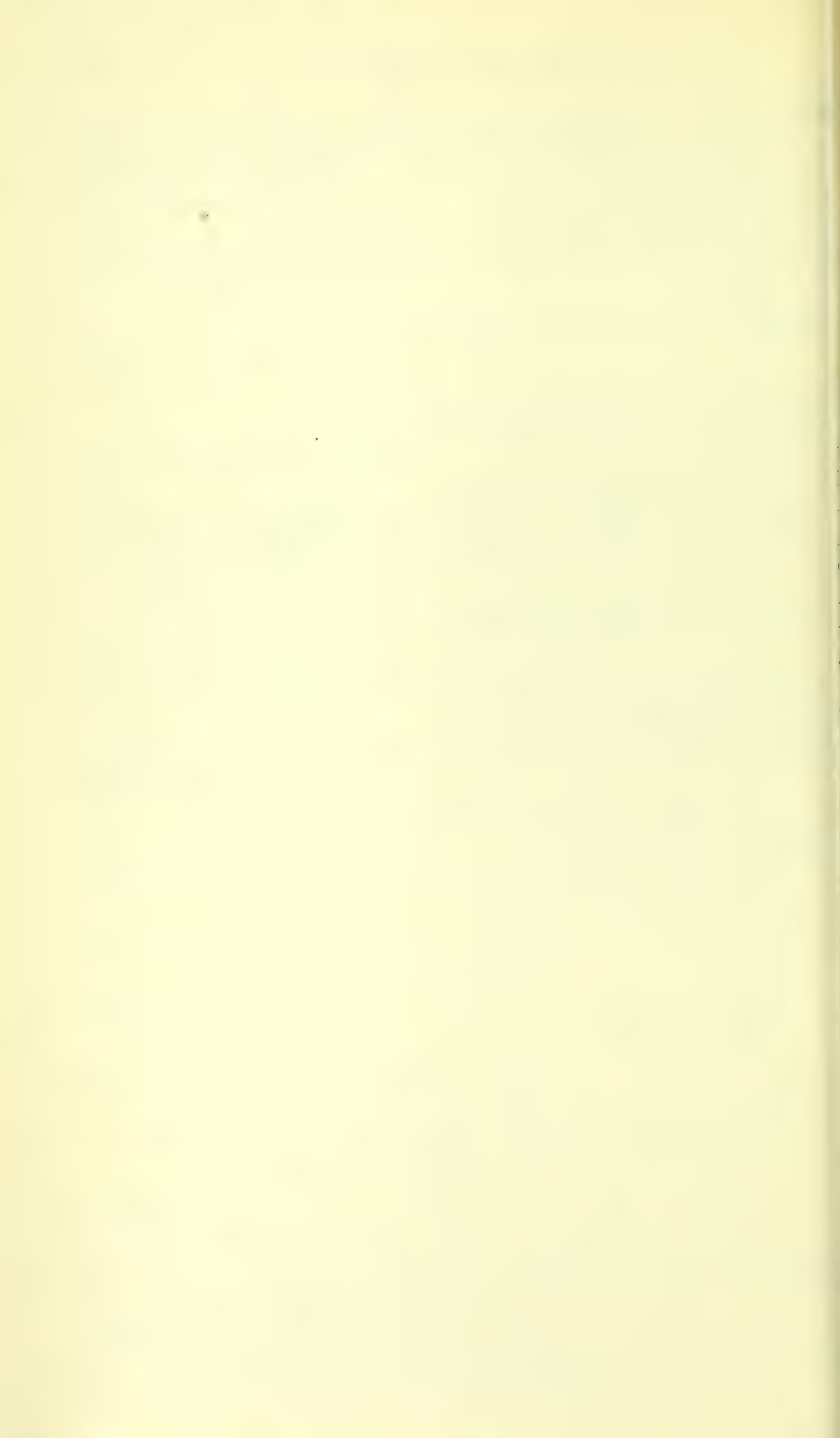
Ramos, R., junior medical officer:

(With Eldridge, Watson W., and Simon, A.) Oxycephaly: Report of two cases. American Journal of Roentgenology and Radium Therapy, vol. 33, no. 4, 1935, pp. 516-521.

Richmond, Winifred V., psychologist:

An introduction to sex education. (Book.) N. Y. Farrar and Rinehart, pp. 314.

Sex problems of adolescence. Journal of Educational Sociology, February 1935, pp. 333-341.



HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, *President*)

The year 1934-35 was the fourth of the 10 years involved in the program of development approved by the Government. The enrollment of the university increased by 281, or 17.3 percent, and the institution was closely approaching the achievement of several of the qualitative objectives set up for the first 5 years of the program. There was an increase of 45, or 30.6 percent, in the number of secondary schools sending students into the undergraduate colleges of the University. There was also an increase of 21, or 65.7 percent, in the number of institutions from which students entered undergraduate colleges of the university with advanced standing. Sixty-six percent of the new entrants into the professional schools were persons having 4 years or more of college training, while 428 students, or 22.4 percent, of the entire enrollment of the university were persons of graduate caliber, holding one or more academic degrees.

There was an increase also of 41 in the number of graduates, as compared with the previous year. The graduates of the university since its beginning now number 9,246. Of these the university has secured 7,000 living addresses in 42 States, the District of Columbia, and 24 foreign countries, and these addresses are classified alphabetically, by sex, by classes, by schools, by cities, and by States. A university-wide placement bureau has been established whereby the continuous services of the graduate body may be available for help in the vocational placement of the current graduates of the university.

The instructional staff of 241 persons, representing a full-time equivalent of 156 teachers, was approximately adequate for the student body, and with but two exceptions, had approximated the student-teacher ratio set-up in the 10-year program of advance for each major division of instruction. Excessive teaching hours and class numbers had been reduced to a minimum, and by far the major portion of instruction was given by teachers under conditions favorable for adequate attention to the individual student. The teaching staff had but slightly passed the half-way mark in maturity, however, as indicated by the program objectives, there being a manifest need for an addition of 30 mature teachers in the professorial rank. The members of the staff continued to take the fullest advantage of

opportunities for further study. Ten percent of the full-time staff were spending the full year in further study in the United States and in Europe. The *Journal of Negro Education* published by the university closed its fourth year with a secure position in the educational world and with increasing support. Members of the teaching staff published 2 books and 92 scholarly articles during the year.

With the restoration of the last 5 percent of the prevailing Government cuts in salary, all teachers in the ranks of instructor, assistant, and associate professor¹ were receiving at least the minimum salary set up in the program, and the average salary in these three ranks had approximated the program average by \$242, \$115, and \$180, respectively. Fifteen professors were still receiving less than the minimum agreed upon in the program, however, and the average professorial salary was still more than \$1,000 below the agreed-upon average. In numbers and in salary the university is still heavily disadvantaged at the most important point in its work, namely, the mature teaching staff in the professorial rank.

This was the first year of the operation of the graduate school as a separate educational division under its own dean. The work was successfully begun with an increase in graduate enrollment from 164 to 225.

During this year the work formerly carried on separately by the college of education was combined with the college of liberal arts, and the work in home economics and art, formerly done in the college of applied science, was also combined with the college of liberal arts. These organizational measures were carried through successfully, resulting in a unified and thoroughly cooperative faculty of liberal arts handling a total of 1,156 students.

The school of engineering and architecture passed through the first year of its existence as a separate school of the university with a total enrollment of 27 students.

The college of dentistry conducted the first successful course in dental hygiene, graduating 8 students.

The trustees of the university voted to establish courses in social service on the graduate level, beginning in the school year 1935-36.

By the use of \$460,000 of funds provided by the Public Works Administration, the university completed the erection of Frederick Douglass Memorial Hall, a modern classroom building accommodating all the classes in the humanities and the social sciences, with offices for the instructional staff and rest rooms for men and women students in the undergraduate colleges.

With the use of a large part of the \$630,000 fund appropriated by the Public Works Administration for the purpose, the university

¹ One exception.

had completed the exterior walls and roof of the new chemistry building and had brought the project within 2 months of completion.

The contract for the new heat, light, and power plant, made possible by an appropriation of \$549,000 by the Public Works Administration, had been let and the work was well under way.

Further improvements to the buildings and grounds were made through assistance given by the Emergency Works Administration, the Bureau for Transients and the Public Works Administration. An additional sum of \$40,884 was spent from the private funds of the university, provided by the General Education Board and the Julius Rosenwald Fund and from the income of properties previously purchased through extension funds, for the purchase of additional lands. The total increase in the land resources for the further expansion of the university, provided from private funds, has now reached the value of \$1,130,282.

The income of the university from all sources was increased during the year by a gross sum of \$474,323, of which \$36,740 represented an increase in current funds. Expenditures were carefully budgeted and the finances were kept at balance with a surplus of income over expenditures. The amount and percentage of funds spent for resident instruction were increased and approximated the percentage set up in the 10-year program by 1.8 percent. Percentages of expenditure for general library purposes and athletics were practically the same as programmed 4 years ago, and the regular costs of operation and maintenance approximated the planned percentage by 1.6 percent.

Seven and one-half percent of all student fees were again devoted to scholarship and student aid. University funds, with the help of the F. E. R. A., were able to provide urgently needed assistance to more than 300 students.

The outstanding needs of the university are (1) money to secure 30 competent teachers in the professional rank; (2) increased scholarship funds for undergraduate schools and substantial increases in the number and size of fellowships for graduate students; (3) the earliest possible expedition of the new library building; (4) increased funds for books in every division, and especially in those departments offering graduate majors; and (5) the early acquisition of dormitory facilities for at least 200 men.

REGISTRATION

1. *Enrollment for the year 1934-35.*—The following table shows the enrollment of Howard University during the year 1934-35, including the first and second semesters and excluding duplicates, distributed by major instructional divisions and by sex, as compared with the year 1933-34.

Summary of students enrolled in Howard University for the years 1934-35 and 1933-34

Divisions of the university	Net enrollments							
	1934-35			1933-34			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....				541	381	160		
College of education (college of education absorbed by liberal arts, 1934-35).....	1, 156	547	609	379	83	296	236	
School of engineering and architecture (formerly applied science).....	27	27	0	67	36	31		40
School of Music.....	60	24	36	49	21	28	11	
Graduate school.....	225	76	149	164	66	98	61	
Total.....	1, 468	674	794	1, 200	587	613	268	
Professional schools:								
Theological college.....	11	10	1	21	20	1		10
Graduate school of theology.....	13	13	0	11	11	0	2	
Law school.....	44	43	1	37	37	0	7	
School of medicine:								
College of medicine.....	168	161	7	203	196	7		35
College of dentistry.....	35	34	1	39	38	1		4
College of pharmacy.....	26	23	3	22	19	3	4	
Total in professional schools.....	297	284	13	333	321	12		36
Total in regular courses.....	1, 765	958	807	1, 533	908	625	241	
Special students in music, law, dentistry.....	142	50	92	93	31	62	49	
Grand total (net).....	1, 927	1, 008	899	1, 626	939	687	281	

The total enrollment for the year 1934-35 was 1,907, of whom 1,008 were men and 899 were women, as compared with the total 1,627 for 1933-34, of whom 939 were men and 687 were women. A net gain of 281 students, or 17.3 percent, is shown as compared with a net loss of 267, or 14 percent, in 1933-34, and a net loss of 571, or approximately 23 percent, in 1932-33.

2. *Geographical distribution.*—Ninety-four percent of the total enrollment during the school year 1934-35 came from continental United States, while 5.1 percent came from without the borders of the United States, as compared with 92.8 percent and 7.2 percent, respectively, during 1933-34. The percentage of candidates for degrees coming from the District of Columbia during 1934-35 was 27.2 percent, as compared with 30.1 percent for the year 1933-34.

Thirty-nine States sent 1,675 candidates for degrees in 1934-35, as compared with 38 States sending 1,423 candidates in 1933-34. The gain of 252 candidates is shown to have been shared by 30 States. Sixteen of them sent increases of from 1 to 5 candidates; 5 States sent increases of from 6 to 10; 7 sent increases of from 11 to 20; while 2 sent increases of 32 and 41, respectively.

Eleven foreign countries sent 90 candidates for degrees during the school year 1934-35, as compared with 14 foreign countries with a total of 110 candidates for degrees in 1933-34.

3. *Widening support of secondary schools.*—During the school year 1934-35, 192 secondary schools sent 409 students into the regular courses of the undergraduate colleges, as compared with 147 secondary schools sending 306 entering students in 1933-34. This represents an increase of 35 schools, or 30.6 percent.

4. *Growth in students of advanced standing.*—During the school year 1934-35, 89 students entered the undergraduate colleges with advanced standing from 57 institutions, as compared with 54 such students from 33 institutions in 1933-34.

Sixty-four, or approximately 66 percent, of 97 students entering the professional schools for the first time during the year 1934-35, were equipped with 4 years or more of college training. Of the 1,907 students in the entire institution, 428, or 22.4 percent, were persons holding one or more academic degrees.

5. *Scholarship and student aid.*—The trustees of the university continued to set aside 7½ percent of all student fees as a special scholarship fund for needy students. They also made special provisions for increased work opportunities for students, continued the reduced price of room and board, as well as the installment system of fee payments. In addition thereto, the Federal Emergency Relief Administration awarded aid averging \$15 per month to 12 percent of the full-time student body. By these combined measures more than 300 students in the undergraduate colleges received at least some aid during the course of the academic year, while approximately 20 percent of the professional students were also helped.

This aid was devised to help students to remain in school who otherwise would have been obliged to discontinue. All scholarships and student aid were awarded to students in the order of excellence in scholastic standing. Support was thereby given to all other measures stimulating earnest scholarly work. Measurably constructive results were manifest in the scholarly performance of the students.

The scholarship committee of the undergraduate colleges reports that it acted upon 1,400 applications for aid during the school year 1934-35, as compared with 625 applications for the preceeding year. These and other indications make us certain that there are many worthy students who desired to enter Howard University but were not able to enter for lack of encouraging aid.

GRADUATES

1. *Number and distribution.*—The following table exhibits the number of graduates from each division of the university during 1934-35, as compared with 1933-34. The table shows that there was a total of 272 students graduated during the year, representing an

increase of 41, as compared with the group of graduates in 1933-34. The percentage of male graduates was 53.7 percent in 1934-35, as compared with 56 percent in 1933-34, while the corresponding percentage of women graduates was 46.3 percent and 44 percent, respectively. The 272 graduates represent 28 states and 4 foreign countries.

Summary of students graduated by Howard University for the years 1934-35 and 1933-34

Divisions of the university	Graduates							
	1934-35			1933-34			Gain	Loss
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	144	55	89	51	28	23	} 22	
College of education.....	(¹)	(¹)	(¹)	71	11	60		
School of engineering and architecture (applied science).....	0	0	0	9	8	1		9
School of music.....	5	1	4	2	0	2		3
Graduate school.....	35	12	23	20	14	15		6
Total.....	184	68	116	162	61	101	31	9
Professional schools:								
Theological college.....	2	2	0	6	6	0		4
Graduate school of theology.....	4	4	0	1	1	0	3	
Law school.....	10	10	0	7	7	0	3	
School of medicine:								
College of medicine.....	55	53	2	47	46	1	8	
College of dentistry:								
4-year course.....	2	2	0	6	6	0		4
Dental hygiene.....	8	0	8				8	
College of pharmacy.....	7	7	0	2	2	0	5	
Total in professional schools.....	88	78	10	69	68	1	27	8
Grand total.....	272	146	126	231	129	102	58	17

¹ Absorbed by liberal arts.

2. *Honorary degrees.*—Two honorary degrees were conferred at commencement in June 1935. William A. Warfield, surgeon in chief, Freedmen's Hospital, was awarded the degree of doctor of laws; and Mary Elizabeth Branch, president of Tilton College, Austin, Tex., was also awarded the degree of doctor of laws.

3. *Placement bureau for graduates.*—A university-wide placement bureau was established in the office of the registrar for the purpose of helping to place the graduates of all divisions of Howard University in competent positions throughout the Nation.

4. *Number and distribution of living graduates.*—The total number of living graduates of Howard University is now 9,246. Of this number the registrar has 7,000 actual addresses in 42 States, the District of Columbia, and 24 foreign countries. These addresses are now classified alphabetically, by States, by cities, by sex, by schools, and by classes.

TEACHING STAFF

1. *Number and distribution of teachers.*—There were 241 members of the teaching staff during the school year 1934-35, of whom 134 were on full time and 107 were on part time, representing together a full-time equivalent of 156 teachers, as compared with a total of 237 members of the teaching staff during the year 1933-34, of whom 135 were on full time and 102 were on part time, representing together a full-time equivalent of 154 teachers. This represents a loss of 1 full-time teacher and the gain of 7 part-time teachers, representing a net full-time equivalent gain of 2 teachers.

2. *Number of teachers in relation to the objectives of the 10-year program.*—The 10-year program for Howard University agreed upon by the Government, sets up certain objectives regarding the ratio of students to teachers in each division of the university. The status of our progress in relation to these objectives is very favorable, there being only two colleges in which the ratio of students to teachers is higher than that provided in the program, namely, liberal arts and music. At present the 225 graduate students are all taught by a group of teachers in liberal arts. This constitutes an additional load for liberal-arts teachers and requires an addition of about nine mature persons to that faculty. On the basis of the program, two additional teachers are needed for music.

While the ratios of full-time equivalent teachers of medicine, law, and religion are adequate, it is apparent that the best work in these schools requires a substantial increase in the actual number of full-time teachers employed as soon as possible.

3. *Teaching hours, class size, and class-hour loads.*—Now that the university has been able to acquire a faculty approximately adequate in numbers, we have been able to reduce the number of excessive teaching hours, class sizes, and class-hour loads to a minimum. Throughout the university there are now only 14 classes of more than 50 students each; there are only 14 teachers carrying more than 16 teaching-hours per week, and only 6 teachers with pupil clock-hour loads in excess of 500. While there are as many as 165 classes with students ranging from 16 to 50 each, by far the majority of classes now enroll 15 students or less, and the major portion of the instruction is given by teachers working an average of 12 hours and less and carrying a pupil clock-hour load of 250 hours or less. This is a very favorable quantitative situation for competent instruction of the individual student.

4. *Maturity of the Staff.*—Of the 156 full time and full-time equivalent teachers on the staff of Howard University during the current year, 32, or 28.5 percent, were professors; 26, or 16.7 percent, were associate professors; 29, or 18.6 percent, were assistant professors; 69,

or 44.2 percent, were in the instructors' rank and below. The 10-year program of development calls for the following percentage distribution in the four leading ranks: professors, 40 percent; associate professors, 10 percent; assistant professors, 20 percent; instructors, 30 percent. On this basis the present staff should have a distribution as follows: 62 professors, 16 associate professors, 31 assistant professors, and 47 instructors. The outstanding need of the university at this moment is the securing of 30 capable scholars for important positions on the professorial staff of the university. All other programs are subsidiary to and wait upon this for their fullest effectiveness.

5. *Improvement of the staff.*—The teachers continued their work of self-improvement through further study. Sixteen of them were on leave of absence or under fellowship privileges with contract to accept appointment at Howard University. This number represents more than 10 percent of the full-time equivalent staff of the university.

6. *Salaries of teachers.*—In the 10-year program of development for Howard University, the Government agreed that the professors should receive a minimum of \$4,000, a maximum of \$6,000, and an average of \$5,000; that the associate professors should receive a minimum of \$3,000, a maximum of \$3,900, and an average of \$3,500; that the assistant professors should receive a minimum of \$2,300, a maximum of \$3,200, and an average of \$2,800; and that instructors should receive a minimum of \$1,600 a year, with a maximum of \$2,500, and an average of \$2,100. With steady and successful steps made possible primarily by a careful use of private funds, the university has gradually advanced toward these objectives. After the restoration of the last 5 percent of the salary cuts hitherto prevailing in the Government, the salary situation at Howard University at June 30, 1935, was as follows: Every full-time instructor was receiving at least the minimum of \$1,600 agreed upon in the 10-year program and the average instructional salary had reached \$1,858, that is \$242 below the agreed-upon average. Every full-time assistant professor was receiving at least the minimum salary of \$2,300 agreed upon in the 10-year program, and the average assistant professor's salary had reached \$2,685 or \$115 less than the program average. Every full-time associate professor in the university save one (to which case a problem of policy was attached) was receiving at least the minimum salary of \$3,000 agreed upon in the program, and the average associate professor's salary had reached the sum of \$3,320 or \$180 less than the program average. There were 15 full-time professors, however, who were receiving a salary less than the minimum agreed upon in the program, and the average pro-

fessor's salary had reached the sum of \$3,893 or \$1,107 below the program average.

It is clear, therefore, that in addition to the securing of an adequate number of full-time professors, Howard University still confronts the task of building up the professorial salary to a point where the full-time professor may freely devote his services to education work under substantially attractive conditions.

GRADUATE SCHOOL

1. *General trends.*—For the first time in the history of the university, graduate work was carried forward in 1934–35 under a separately organized graduate school, with a separate dean and faculty.

Prof. Dwight O. W. Holmes, formerly dean of the college of education, was elected dean of the graduate school, beginning July 1, 1934; and by vote of the board of trustees, on October 23, 1934, the administrative affairs of the graduate school were placed in the hands of "the graduate council", composed of the president of the university, the dean of the graduate school, the registrar of the university, and the heads of the 15 departments authorized to offer graduate majors. This council was given all the powers of a faculty as defined by the charter and bylaws of Howard University.

The graduate school began auspiciously with an enrollment of 225, representing an increase of 61 students over the previous year, and the largest graduate enrollment in the history of the institution. The trustees voted to institute graduate work in social service in 1935–36, and by vote of the graduate council the work of the school will be extended into the field covered by the preclinical branches of medicine during the school year 1935–36.

2. *Distribution of enrollment by departments.*—The graduate enrollment was distributed among departments as follows: Botany 6, chemistry 9, economics 2, education 91, English 31, German 5, history 19, mathematics 10, philosophy 1, physics 2, political science 5, psychology 21, Romance languages 10, sociology 8, zoology 5; total 225.

3. *Scholarships and fellowships.*—During the year 42 graduate students received fellowships, scholarships, or some form of aid, totaling \$6,648. There is urgent need of an increase in the number and size of the stipends available.

4. *Courses in social work.*—The board of trustees has authorized the inauguration of courses in social work for the year 1935–36. Plans for this work are going forward, and both preparatory courses offered by the college of liberal arts and professional courses offered by the graduate school will be scheduled during the year 1935–36. The course of study for those interested in this work

will be under the direction of the department of sociology. In view of the present pressing demand for professionally trained workers, this promises to be a substantial contribution which the university can make to social improvement.

6. *Faculty*.—During the school year 1934–35 all the work in the graduate school was done by members of the faculty of the college of liberal arts. During the coming year members of the faculty of medicine will give assistance.

7. *Graduate degrees conferred*.—Thirty-eight graduate degrees were awarded during the year, 13 to men and 35 to women. Thirty-one of the candidates received the degree of master of arts, and seven received the degree of master of science.

8. *Research and publications*.—The university considers that research is indispensable to its teachers. In spite of meager funds some of our teachers go forward continuously. The Journal of Negro Education closed its fourth successful year, with a secure position in the educational work and with increasing support.

9. *The future of graduate work*.—The university is proceeding with caution and care to establish the work for the master's degree on a thoroughly sound basis before undertaking at all further work for the doctor's degree. The establishment of the graduate school as a separate division and the inauguration of work toward the master's degree in 15 departments emphasize the need for the earliest possible advancement of all those phases of university life which may assure the sound competence of this work: (1) The maturing of the staff through the securing of an adequate number of scholars in the professorial ranks; (2) the development of a substantial number of scholarships and fellowships for advanced students; and (3) the rapid advancement of book collections in every department offering graduate work.

THE COLLEGE OF LIBERAL ARTS

1. *The enlarged college*.—This was the first year of the absorption by the college of liberal arts of the entire work in education, formerly done by the college of education which ceased on July 1, 1934, its existence as a separate division, and of the departments of art and home economics of the former college of applied science which on July 1, 1934, changed its character and became the college of engineering and architecture. On the whole the change appears advantageous. Where formerly there were two colleges operating side by side with some duplication of effort, we now have a single college with a unified purpose and with perfect staff cooperation.

2. *Students*.—The student registration during the current year was 1,156, of whom 547 were men and 609 women. These were distributed by departments as follows: Art, 110; botany, 120; chemistry,

273; commerce and finance, 118; economics, 70; education, 535; English, 768; freshmen orientation, 77; German, 198; history, 499; home economics, 171; Latin, 32; mathematics, 169; military science and tactics, 237; philosophy, 79; physical education for men, 225; physical education for women, 263; physics, 103; political science, 165; psychology, 307; romance languages, 267; sociology, 162; and zoology, 157.

3. *Graduates*.—During the academic year 144 degrees were conferred, distributed as follows: Bachelors of arts, 32; bachelors of science, 26; bachelors of science in commerce, 6; bachelors of arts in education, 55; bachelors of science in home economics, 11; bachelors of science of art, 3.

4. *Faculty*.—There were 84 active members of the faculty of the college of liberal arts during the academic year 1934-35. Of these 21 were professors, 14 associate professors, 19 assistant professors, 22 instructors, 7 assistants, and 1 technician. Eleven were on leave of absence during 1934-35. Nine others will be on leave of absence during 1935-36. There were 8 appointments, including substitutes for teachers on leave, and 2 retired for age after 44 years of service each.

5. *Special lectures and conferences*.—During the year the departments of the social sciences sponsored at the university a group of lectures upon the Problems, Programs, and Philosophies of Minority Groups. A month later a national conference was held under the auspices of the social science division of Howard University and the joint committee on national recovery upon the general theme, the Position of the Negro in Our National Economic Crisis.

6. *New building facilities*.—A new classroom building, made possible by funds from the Public Works Administration, the Frederick Douglass Memorial Hall, was dedicated on April 30, 1935. This new structure stands high among academic buildings of the country. The departments of instruction occupying it are the humanities group, the social sciences group, and the department of psychology. The college of liberal arts is very grateful for this splendid addition to its facilities.

The department of chemistry and the college of liberal arts as a whole are looking forward with pleasure and appreciation to the early completion of the new chemistry laboratory, which will offer to our work here in chemistry accommodations and equipment ranking among the best in the country.

SCHOOL OF ENGINEERING AND ARCHITECTURE

1. *Reorganization*.—On June 30, 1934, and by an act of the board of trustees, the college of applied science was abolished and its departments of art and home economics transferred to and placed under

the administration of the college of liberal arts. Its departments of architecture, civil engineering, electrical engineering, and mechanical engineering were reorganized and now are administered under the separately established new school of engineering and architecture.

The school of engineering and architecture began operation under the university's new plan of organization July 1, 1934. This is the only school in the United States primarily for Negroes, offering undergraduate curricula leading to the degree of bachelor of science in civil, electrical, and mechanical engineering, and in architecture.

2. *Aims.*—It is the aim of the school (1) to prepare students for entrance to the professions of architecture, civil engineering, electrical engineering, and mechanical engineering, (2) to place strong emphasis on undergraduate programs, and to pursue the practice of directing certain of its graduates to other institutions for advanced work.

3. *Enrollment.*—During the school year 1934–35, 46 individual students pursued courses in the departments covered by this school, of whom 31 were candidates for degrees as compared with 23 in 1933–34. The following table shows the number of courses offered in each department and the number of students taught in each course.

Courses and enrollment, by departments, school of engineering and architecture, 1934–35

Department	Number of courses offered		Number of students taught	
	First semester	Second semester	First semester	Second semester
Architecture.....	10	12	22	41
Civil engineering.....	10	14	27	32
Electrical engineering.....	3	4	8	8
Mechanical engineering.....	7	11	12	18

4. *Scholarships.*—Nine scholarships, including 4 F. E. R. A. work scholarships were awarded to students in this school during the year.

5. *Graduates.*—There were no degrees awarded in the school of engineering and architecture in the year 1934–35, as compared with nine degrees in the year 1933–34. This unusual circumstance is due to the period of transition incident to the reorganization of the various departments and their operation upon an improved basis under the new school of engineering and architecture. There will be eight seniors for the year 1935–36.

The 4 departments of this school have 58 graduates to date, as follows: Architecture, 11; mechanical engineering, 2; civil engineering, 23; and electrical engineering, 22.

A number of our graduates are holding representative positions in their respective fields in Federal and municipal government divisions

or as private practitioners in such areas as the States of Florida, Georgia, Illinois, New York, Pennsylvania, the District of Columbia, and in Cuba, Russia, and Santo Domingo.

6. *Teaching staff*.—The faculty of the school of engineering and architecture for the school year 1934-35 included eight full-time members. One member of the faculty remained on leave, serving as architect to the Subsistence Homesteads Division of the Public Works Administration.

SCHOOL OF MUSIC

1. *Enrollment*.—The enrollment of the school of music again showed an increase in 1934-35 in a general trend of increased music enrollment over a period of 6 years. There was an average enrollment during the current year of 178 as compared with 140 during the year 1933-34, with 46 new matriculants in the first semester and 15 in the second.

2. *Scholarship and student aid*.—Sixteen students received scholarship aid during the year from 4 sources: Special university scholarships of \$150, 7; gift scholarships from the school of music, 5; and work scholarships through the university and the Federal Emergency Relief Administration, 3. These scholarships are responsible, in a very large part, for the increased enrollment of the school.

3. *Courses and faculty*.—Courses were offered in piano by 2 teachers, in organ by 1 teacher, in voice by 3 teachers, in violin, orchestration, string, and percussion instruments, by 1 teacher; in public-school methods, by 1 teacher; in theory and appreciation of music, by 2 teachers; and in the junior piano department, by 3 teachers. The total faculty of 11 included 1 professor, 2 assistant professors, 6 instructors, and 2 assistants. One member of the faculty was away on sabbatical leave for further study in Vienna, Austria. Three members of the faculty appeared in recitals in 11 States and the District of Columbia.

One member of the faculty has been chosen by the Theatre Guild of New York to create the leading role in George Gershwin's opera production, "Porgy and Bess."

4. *Musical organizations*.—Three of the musical organizations functioned during the year—the university choir, the university glee club for men, and the university glee club for women. The university choir was the largest and best organization in the history of the institution. Together with the many fine voices, the new pipe organ added much to the quality, depth, and richness of tone.

6. *University concert series*.—On the concert series program, under the auspices of the school of music, there appeared 1 organist, 1 singer, 2 pianists, 1 violinist, 2 glee clubs, and the National Symphony Orchestra of Washington. Each recital was not only well attended

by interested and sympathetic music lovers, but also the financial returns were most encouraging for the continuance of the series.

7. *National Music Week.*—For the first time the school of music observed in a formal manner National Music Week, at which time 5 concerts served as a source of inspiration, education, and enjoyment to those who were present.

8. *Graduates.*—Five degrees were conferred at commencement. Two degrees of bachelor of music were conferred upon students with majors in piano, and 3 degrees of bachelor of school music upon students specializing in public-school music.

MILITARY SCIENCE AND TACTICS

1. *Excellent rating for the second successive year.*—The Howard University R. O. T. C. bears the rating of "Excellent" for the years 1933-34 and 1934-35. This rating, which is the highest of the War Department, was given as the result of the formal inspection during the spring of 1934 by Maj. T. M. Chambliss, Inspector for the Third Corps Area, and again in the spring of 1935 by Maj. E. W. Leard, Inspector for the Third Corps Area. In making their reports to the War Department these inspecting officers especially commended the efficiency of the instruction given by the military staff, the ability, neatness, and discipline revealed by the student cadets, the large improvement in the physical facilities of the R. O. T. C. rooms in Spaulding Hall, and the cooperation received from the officials of the University.

2. *Enrollment.*—The enrollment in military science and tactics during the year 1934-35 was 268, as compared with an average of 256 during the preceding year. Two hundred and twelve of the students were enrolled in the basic course and 56 in the advanced course.

3. *Commissions awarded.*—Twenty-eight students were awarded commissions as second lieutenants of infantry, in the Reserve Corps of the United States Army.

4. *Teaching staff.*—The teaching staff included 5 members, as follows: professor, 1; assistant professor, 1; assistants, 3.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the university without superseding the direct lines of authority from the independent faculties of its member units to the board of trustees. Freedmen's Hospital, an independent institution built upon grounds owned by the university, is functionally a part of the university medical unit.

COLLEGE OF MEDICINE

1. *Survey of the college.*—The survey of the school as part of the nation-wide survey of medical schools in the United States and Canada by the Council on Medical Education and Hospitals of the American Medical Association, in cooperation with the Association of American Medical Colleges and the Federation of State Boards, was the outstanding event of the year. Although no report will be available until the general survey has been completed, the study of this school revealed that our major problems are:

(1) Provision of a greater number of well-trained clinical teachers, the major portion if not all of whose time can be controlled by the university for clinical service and clinical teaching; (2) a greater quantity and variety of clinical material under adequate control for teaching purposes; and (3) facilities for the study of tuberculosis and acute contagious diseases.

2. *Students.*—Of a total of 211 applicants for admission, 119 satisfied the minimum requirements for admission. Forty new students were admitted. The highest number registered at any one time during the year was 167.

3. *Instruction.*—During the year instruction has been furnished to 248 students; 167 from the college of medicine, 35 from the college of dentistry, 14 from the college of pharmacy, 1 from the college of liberal arts, and 31 nurses from the Freedmen's Hospital. Instruction included for the first time a course in anatomy for art students, a course in public health for college students, and a course in physiology for home-economics students.

4. *Scholarship and student aid.*—In accordance with the scholarship-aid plan, 7 full-tuition scholarships and 13 half-tuition scholarships were awarded to medical students. Twenty-four other needy students were aided by the Federal Emergency Relief Administration.

5. *Graduates.*—Fifty-five graduated with the degree Doctor of Medicine. Fifty of these accepted internships in 12 approved hospitals.

6. *Faculty.*—Two full-time new appointments to assistant professorships were made of former General Education Board Fellows, 1 in anatomy and 1 in public health. Two General Education Board Fellows, one in physiology and the other in pathology, have been reappointed for a second year of graduate study at the University of Chicago and Western Reserve, respectively. Of the faculty of 98, 20 were full-time teachers as compared with the faculty of 62, with 3 full-time teachers in 1929-30. One member studied dermatology and syphilology in Europe during the year under a grant from the Oberlaender Trust of Philadelphia. Another has been

granted leave of absence for a year's residency in tuberculosis. Five are at special study during the summer. There have been 23 scientific publications by members of the faculty during the year 1934-35. Five other publications are in the press.

The college of medicine was represented on the program of the Federation of American Societies for Experimental Biology in Detroit in April by the head of the department of physiology, the head of the department of pharmacology, and the acting head of the department of biochemistry. The college was represented on the program of the American Association of Anatomists by the associate professor of anatomy.

7. *Departmental, interschool, hospital, and community relations.*—The dean of the college of dentistry gave a series of five lectures to medical students on diseases of the mouth. Dr. Wm. A. Warfield, surgeon-in-chief of Freedmen's Hospital, has made available four rooms in the hospital, three to be used as offices for the heads of the clinical departments and one to be used by the clerk for these departments.

The newly appointed health officer of the District of Columbia made available to the school the facilities of the Municipal Tuberculosis Hospital, the City Prenatal Clinic, and the City Infant Welfare Station located at Freedmen's Hospital.

Following approval of the Freedmen's Hospital by the Council on Medical Education and Hospitals of the American Medical Association for residencies in medicine, pediatrics, surgery, obstetrics, and gynecology, two residents were appointed to begin service October first, 1 in pediatrics, and 1 in obstetrics-gynecology. This marks the beginning of a much-needed improvement in the hospital service and should reflect favorably upon the clinical teaching. Howard University has provided an annual stipend of \$500 for each of the two residents appointed. This is a very important accomplishment.

COLLEGE OF DENTISTRY

1. *General trends.*—Though the college of dentistry is stressing, through an enrollment campaign, the acquisition of numbers, major emphasis is being placed upon the quality of students it attracts. The high caliber of recent graduates is a fair testimonial of our rigid adherence to entrance and curricular requirements. A check-up on the performance of our recent graduates before State boards reveals a decided increase in the percentage of successful candidates.

2. *Enrollment.*—The school year opened with a registration of 4 seniors, 5 juniors, 13 sophomores, 13 freshmen, and 9 students in the new department of oral hygiene. With an alleviation of financial handicaps, through university aids and general economic better-

ment, our incoming classes will eventually make up the enrollment deficiency which we now suffer.

3. *Graduates*.—Three graduating students were awarded the degree of doctor of dental surgery at the June commencement. Eight students were awarded certificates in oral hygiene.

4. *Oral hygiene*.—The department of oral hygiene rounded out its first year of operation with a commendable record of success. As an indication of the splendid work done by them as students, 6 of the 8 graduates took the examination for licensure in the District of Columbia and all were successful.

5. *Faculty*.—There were 13 active members of the faculty during the year, distributed as follows: Two associate professors, one assistant professor, and 10 instructors.

The following promotions and appointments were made this year: One member of the faculty was promoted from instructor to the rank of assistant professor of dentistry; one to the rank of assistant in the department of oral hygiene; one additional instructor was employed on half-time for the months of May and June; and one was granted leave of absence for the year 1934-35. Four members of this faculty published five scholarly articles during the year. The dean has inaugurated a program for further specialized study on the part of teachers.

6. *Library*.—In order to render more effective library service, the college of dentistry transferred its books and periodicals to the medical school library, where it will share in the facilities of this well-organized department.

THE COLLEGE OF PHARMACY

1. *Organization and curriculum*.—Since 1932 the College of Pharmacy has given instruction in the following departments: Pharmacy, pharmacology, pharmacognosy, physiology, bacteriology, preventive medicine, and public health, with instruction in English, modern and romance languages, mathematics, chemistry, physics, economics offered in the college of arts and sciences of the university. The curriculum for the college of pharmacy for the 4-year course leading to the degree of S. B. in pharmacy has been adjusted to conform to requirements of the National Association of Colleges of Pharmacy.

2. *Registration*.—Twenty-four students registered in the college of pharmacy; 8 in the freshman class, 8 in the sophomore class, and 3 in the junior class. This enrollment shows an increase of two students over last year.

3. *Scholarship and student aid*.—During the year 1934-35, two work scholarships were awarded in the first semester and three in the

second. One tuition scholarship of \$70 was awarded. Two others applied, one of whom did not meet requirements for award, and the other was recommended but could not accept, being unable to meet the other expenses of the course.

4. *Graduates*.—There were 7 graduates from the college, 5 from the 3-year, 2 from the 4-year course, 2 having advanced standing which enabled 1 to complete the course in 3 years and the other in 1 year.

5. *Faculty*.—There has been no change in the faculty in 1934-35 as compared with 1933-34. The staff included 2 full-time persons who are heads of departments, 1 of whom is vice dean of the college, 1 associate professor, 1 full-time instructor, 1 part-time instructor, and 1 lecturer. Two scientific papers were published by faculty members during the year.

The college was represented on the program of one of the joint meetings of the Association of Colleges of Pharmacy and the National Association of Boards of Pharmacy, held in Washington during the year.

6. *Equipment*.—The physical equipment is now quite adequate. Additions and improvements are being made, to some extent, annually.

7. *Library*.—The library for the college of pharmacy is included in the medical school library. As a separate pharmaceutical school library it had been practically insignificant. During the past year, however, some 50 volumes have been added to the list and it is hoped gradually to accumulate a creditable library.

SCHOOL OF LAW

1. *Enrollment*.—The enrollment for the school of law showed a slight increase over that of 1933-34. Figures for the last 3 years are as follows: 1932-33, 44; 1933-34, 38; 1934-35, 46. The most significant thing about the student body is the speed with which the school of law is approaching a purely graduate basis. Every member of the senior class, 1934-35, had his college degree; 31 of the 46 students had bachelor's degrees and 9 had at least 3 years of college work.

In an effort to increase the enrollment the vice dean visited and spoke at some 10 colleges during the year.

2. *Graduates*.—Nine graduates received the degree of bachelor of laws in June 1935, as compared with 7 in 1933-34.

3. *Faculty*.—There were 10 active members of the teaching staff during the year. Four of them were full-time members and 6 were serving for part-time. During the school year, 1 member of the faculty received the S. J. D. degree from Harvard University,

another published in the Iowa Law Bulletin an extended scholarly examination of "Title to Lands by Adverse Possession", and the vice dean of the school continued his participation in matters of public concern affecting the status of Negroes before the law.

4. *Physical plant*.—The inadequacies of the physical plant of the school of law have been pointed out in previous reports. The trustees plan to move the school to the main campus of the university during the school year 1935-36.

5. *Library*.—As of June 30, 1935, there were 15,823 books accessioned on the library records.

6. *Vice dean on leave*.—After 6 years of vigorous and constructive service in which he has led in the transformation of the school of law from a part-time evening school into a full-time day school of law admitted to membership in the American Association of Law Schools, vice dean Houston is taking a year's leave of absence. Professor Taylor will serve the year in his stead.

SCHOOL OF RELIGION

1. *General trends*.—The school of religion at Howard University is passing through a period of transition. It is eliminating the 4-year theological college and establishing the school on a graduate basis. For 3 years, now, we have accepted only such new students as come to us with a college degree or its equivalent. Our total enrollment during the period of transition has naturally declined in view of the fact that we cannot accept high-school graduates as in former years. June 1936 will see the end of the theological college.

2. *Changes in curriculum*.—Instead of the one oral examination on the mechanics of the Bible, as part requirement for the B. D. degree, two other examinations have been added. The students must pass an oral, comprehensive examination on the various fields of religion and he must defend, by oral examination, his thesis.

3. *Enrollment*.—The total enrollment in the two departments was 28—14 in the graduate school and 14 in the theological college, a decrease of slightly more than 24 percent over that of last year. Though the total enrollment was decreased, there was an increase of 33 percent of the regularly classified students in the graduate school.

4. *Faculty*.—Not being supported by the Government, the funds for the school of religion are meager. We are not able to employ a staff of full-time teachers. We must rely, for at least half of the teaching staff, upon part-time teachers, men who have regular employment in the churches or universities of the city. We had 3 full-time teachers and 6 part-time teachers for the first semester,

and 7 part-time teachers for the second semester. Three members of this faculty published five scholarly articles during the year.

5. *Extension work.*—The school of religion sponsors an annual institute for rural and small-town ministers, in Kinston, N. C. It serves the churches of the city of Washington also by providing courses in religious education. Our students work in the churches of the city. We supply the Sunday speakers for the Maryland Normal School in Bowie, Md.

6. *Needs of the school.*—The school needs a more adequate building, a modern library, an increase in the amount of its scholarship fund, and a full-time staff of at least six teachers.

7. *Graduates.*—Six students were graduated on June 7, four receiving the B. D. degree and two the B. Th. degree.

PERSONNEL

The personnel division of the university includes the registrar, the division of student health, the dean of men, and the dean of women.

1. *Registrar.*—In addition to the routine duties of the registrar set forth in the last report, this office has undertaken to establish and maintain a university-wide placement bureau so that information and assistance in connection with employment may be available to graduates of every school and college of the university.

During the school year 1934-35 the registrar also utilized the services of 14 F. E. R. A. students to compile valuable statistical information concerning the graduates of Howard University.

2. *The dean of women.*—The work of the dean of women falls into the following divisions: Housing of students, supervising student organizations, vocational guidance, part-time placement, scholarships, establishing and maintaining social standards on the campus, academic advising and supervising students on problems. The calendar for student activities participated in by men and women is kept by the dean of women, who must approve and provide chaperons for all of these functions.

3. *The dean of men.*—The dean of men reports that the male students made an unusually heavy demand for dormitory accommodations during the year. As a result, Clark Hall was overcrowded, with an average of over 169 students in the building, primarily on three floors. Fifty professional and graduate students were accommodated at Miner Hall and 14 additional students were accommodated in the International House. This made a total of 233 students crowded in the meager dormitory facilities for men during the year, with only Miner Hall furnishing reasonably satisfactory conditions. The crowded condition in Clark Hall caused a great deal

of anxiety throughout the year. The trustees have voted that the accommodations in this hall during the next school year shall be limited to 125 students, and they have further voted that the International House shall be torn down. Dormitory accommodations for male students will thus be reduced to a maximum of 176; and the need for the new dormitory becomes manifestly more urgent.

4. *Student health*.—The Howard University health service is staffed with 1 full-time physician, 2 full-time nurses, a full-time secretary, and 5 part-time student assistants.

This office examined the incoming freshman class for physical defects and gave this group conferences as to the findings. It also extended practically unlimited medical service to the university student body, giving 2,974 medical consultations during the year. Eighty-six students were confined to the university infirmaries for an average of 4 days each, while 10 students were confined to Freedmen's Hospital for an average of 10 days each.

Community hygiene included sanitation of the buildings and grounds and the care of sanitation of the university swimming pool, which was rated to be the most sanitary of the 25 pools in the District of Columbia.

LIBRARIES

1. *Accessions*.—There were 6,727 accessions during the year. The total number of volumes in all libraries is now 90,753. Total number of accessioned volumes in the general library, departmental libraries, and medical school library, 74,957; total number of acquisitions in the law library, 15,796. One thousand three hundred ninety-one volumes were bound during the year. The total number of subscriptions to periodicals was 544.

2. *Gifts*.—The university libraries have received from Howard University, governmental departments, other libraries and institutions, and individual donors 1,449 gifts.

3. *Reference librarian*.—A special reference librarian was assigned to aid students in the use of the catalog with reference questions, and in the preparation of bibliographies and student papers.

4. *F. E. R. A. student aid*.—Thirty-seven students receiving aid from the F. E. R. A. assisted with many useful library projects. Fourteen were employed regularly.

5. *Publicity*.—Members of the staff posted weekly lists of the additions of volumes to the library and assisted in the preparation of 4 publications. There were 15 exhibitions in the general library during the year.

6. *Loans*.—The library has borrowed for students and teachers through interlibrary loans a total of 390 volumes. Carnegie Library has loaned to other libraries 19 volumes.

7. *Loans from Veterans' Bureau collections.*—The preparation and distribution of Veterans' Bureau books to approved schools and institutions have been accomplished through the aid of four students regularly employed on F. E. R. A. scholarships. Twenty-six thousand three hundred and thirty-five volumes were loaned since July 1, 1934 to 83 schools and institutions.

8. *Moorland Foundation.*—The Moorland Foundation has rendered excellent service to the members of the faculty and to students interested in the fields of Negro literature, art, history, and sociology. Research demands on the material in the collection from persons not connected with the university have increased during the year. Reference and bibliographical aid has been rendered in the form of reading lists on various subjects requested by readers. The assistance of two F. E. R. A. workers has helped to make this service possible. This collection added 766 volumes during the year. It now contains 5,141 bound volumes by and about the Negro.

9. *The professional libraries.*—In the law library growth and progress on the part of the staff and library are noted. A notable gift of 1,500 law reports was made to the library by Mr. James Marshall, of New York City. The fact that this library does not have sufficient stack space to shelve this contribution indicates an urgent need for larger quarters. The number of acquisitioned volumes is 15,796; total circulation, 460 volumes; gifts, 1,770 volumes.

The medical school library reports an increase in the number of additions by purchase and by gift over those of the previous year. The number of periodicals on circulation has increased from 138 to 166. The transfer of 971 volumes from the dental school library to the medical school library was made at the beginning of the year. The total number of volumes reported in this library is 9,257; total circulation for the year, 42,560 volumes.

10. *Cataloging.*—Thirty-two thousand four hundred and twenty-three cards were made and filed, and 5,241 volumes were cataloged and recataloged.

11. *Staff.*—The professional staff of the main library is composed of 8 persons, 1 of whom has written and published 8 scholarly articles during the year. The law and medical libraries carry a single professional staff worker with student assistants.

12. *New library building and the future outlook.*—With the shelving of the additions of the year, we have found stack space in the general library exhausted. It was necessary throughout the year to shift constantly in order that books might be kept shelved in the proper classification scheme. The volumes anticipated from recent orders, together with those expected from the bindery, will necessitate removing to the basement the books not often called for, so that space may be provided in the stacks. In

addition, the purchases out of the 1935-36 budget must be shelved. The need for a new library building, therefore, becomes an urgent one, while the constant fear that scattering the collection in different parts of the building will cripple service, is ever before us.

13. *Election of new librarian.*—Mrs. Emma Murray, acting librarian since the death of Mr. Williams, has closed a very helpful period of service. The university has chosen Prof. Walter G. Daniels, formerly of the staff in education, as full-time librarian.

BUILDINGS AND GROUNDS

1. *Two divisions of work.*—Work on the buildings and grounds of the university went forward during the year under two major divisions: (1) The regular university department of operation and maintenance, and (2) building construction work under the direction of an architect, with a contract for each project.

2. *The regular work of operation and maintenance.*—During the fiscal year 1934-35 the activities of the department of operation and maintenance included: (1) Regular routine repairs and improvements to buildings and grounds covered by the regular maintenance budget; (2) the maintenance of extension-fund properties, and the supervision of contract work on the same; (3) special services to the several departments of the university, chargeable to funds in their several budgets; and (4) the planning and supervision of a considerable amount of work performed under special grants from the Emergency Works Administration, the District of Columbia Bureau for Transients, and the Public Works Administration.

Emergency Works Administration project.—From November 1934, through the end of the fiscal year, the following work on university grounds was accomplished with laborers made available by the Emergency Works Administration: Improved roadways on the main campus, the resurfacing of 4 tennis courts, the laying of approximately 250 feet of 6-inch sewerage, the laying of approximately 800 feet of concrete curbing, the preparation of beds for the planting of shrubbery and other plants, together with assistance to the gardener in the university nursery.

Allotment from Bureau for Transients.—Laborers supplied by the Bureau for Transients did the following work between September 1934, and the end of the fiscal year: Shored up grandstand supports, erected chain-link fence, and cleared southwest corner in the stadium; turned over compost in the nursery; laid approximately 150 feet of 8-inch sewerage on the grounds east of Miner Hall; aided in the preparation of planting areas on various parts of the campus; did some cleaning in buildings, and moving of furniture.

Public Works Administration appropriation for repairs.—A special P. W. A. appropriation (project no. 37) made possible the installation, early in 1935, of a fire escape on the south side of Science Hall.

3. *Public Works Administration building projects.*—The following table shows the list of building projects in process during the year ending June 30, 1935. All these projects were going forward on P. W. A. funds.

Building projects in process, 1934-35

No.	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building.....	May 4, 1929	\$626,300.00
5	Construction and equipment of a library building.....	Feb. 14, 1931	800,000.00
7	Construction and equipment of a classroom building.....	do.....	461,200.00
8	Construction and equipment of a heat, light, and power plant.....	Feb. 17, 1933	528,076.99

The status of the above-listed projects was as follows at June 30, 1935:

Project no. 2, chemistry building.—External walls and roof complete; building expected to be ready for occupancy about November 1, 1935.

Project no. 5, library.—Plans and specifications were approved by the Government in October 1934, and the architect was preparing same for bids when \$500,000 of the appropriation was temporarily impounded by the President of the United States. Application for restoration of the appropriation is still pending.

Project no. 7, classroom building.—Project complete; dedicated under the name of Frederick Douglass Memorial Hall and placed in use during the second semester of the current year.

Project no. 8, heat, light, and power plant.—Contracts were let and the building was under way. Completion is promised by the architect in time for the heating season 1935-36.

FINANCES

The total assets of the university at June 30, 1935, were \$7,323,287.28, exclusive of the unexpended balances of Government appropriations for the chemistry building, the classroom building, the heat, light, and power plant, and the library. Of the total assets \$1,130,282.20, an increase of \$40,883.95 since the last report, represents assets in the physical plant extension made possible through private gifts from the general board and the Julius Rosenwald Fund; \$910,127.15, an increase of \$48,973.48 since the last report, represents endowment; \$5,097,399.69, an increase of \$817,009.40 since the last report, represents plant fund assets, exclusive of the

unexpended balances of Government appropriations for buildings, as indicated above. The remaining \$167,234.66 represents assets of the current fund.

The total income for the year was \$1,743,818.99, including current and capital funds. This represents a gross increase of \$474,323.05 over the total income for 1933-34. The total income for current expenses was \$987,212.71, representing an increase of \$36,740.22 over the income for 1933-34, shared by both Government and private sources.

The total expenditures for all purposes, current and capital, were \$1,709,992.63, representing an increase of \$590,945.20 over the expenditures for 1933-34. The total expenditures for current purposes, however, were \$953,386.35, representing \$3,461.34 less than the preceding year.

Attention is respectfully directed to the increase in the amount and in the percentage of current funds used for resident instruction and to the reduction in the amount and percentage of current funds used for the operation and the maintenance of the physical plant. The former is only 1.8 percent below the programed percentage and the latter only 1.6 percent above it. The percentage of funds spent for general library purposes and for athletics is approximately the same as the programed objectives. These indices afford effective tests of the competence of financial administration in relation to educational objectives.

Once again careful budgeting and economic administration have made possible an excess of income over expenditures in the amount of \$33,826.36.

The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress were expended under the supervision of the Department of the Interior.

FREEDMEN'S HOSPITAL

(W. A. WARFIELD, Chief Surgeon)

The hospital was operated to full capacity throughout the year, and there were numerous occasions when applicants for treatment could not be accommodated because of limited facilities.

The professional activities of the hospital accomplished all that could be expected with available funds.

It was a continuous struggle to supply the many wants and at the same time keep within appropriations as required by law.

PATIENTS

At the beginning of the year, there were 236 patients remaining from the preceding fiscal year, who, with 5,034 admissions during the year, made a total of 5,270 indoor patients under care. Of those remaining, 36 were pay patients, 59 indigent residents of the States, and 141 indigent residents of the District of Columbia. Of those admitted into the hospital, including births, 682 were pay patients, 1,755 were indigent residents of the States, and 2,597 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 5,037, of whom 2,676 had recovered, 1,838 improved, 156 unimproved, and 367 died, leaving 233 in the hospital July 1, 1935, of which number 30 were pay patients, 74 indigent residents of the States, and 129 indigent residents of the District of Columbia.

Of the deaths, 93 were coroner's cases, 130 died within 48 hours after admission, and 30.6 percent were autopsied at the hospital. The mortality rate from all causes was 6.9 percent.

There were 2,579 surgical operations, or 371 in excess of last year. In the dental department 2,505 received treatment.

In the out-patient department 24,024 received care, of whom 6,709 were new cases and 17,315 old. There were 6,672 emergencies. This department as well as the indoor was overcrowded, and many applicants could not receive attention because of insufficient personnel.

The following table shows the number of visits to the various clinics:

Clinic	Number of visits	Clinic	Number of visits
Dermatology.....	925	Oral surgery.....	123
Ear.....	217	Orthopedic.....	4,709
Nose.....	300	Pediatric.....	2,473
Throat.....	1,778	Prenatal.....	1,254
Eye.....	1,617	Postnatal.....	375
Urological.....	3,914	Surgical dressing.....	5,242
Gynecological.....	2,593	Minor surgery.....	1,042
Lutetic.....	3,682	Tubercular.....	353
Medical.....	4,899		
Neurological.....	730	Total.....	36,026

The total number of patients receiving hospital care was 30,696, or 11,302 more than during the preceding year.

NEEDS

Among the most pressing needs of the hospital is a larger personnel. During the last few years several buildings have been added to the hospital without any increase in the necessary personnel required for satisfactory operation. Especially is this true in the nursing department, where the most glaring deficiency exists.

Twenty-one additional graduate nurses must be employed in order that the patients may be given at least the minimum of required care, and at the same time reduce the hours of duty for the nurses to a daily basis of 8, which is in accordance with minimum standards.

A clerk is urgently needed in the social-service department. This branch of the hospital has two workers, but no regular clerk. At times a clerk is detailed from some other department to help out, but this is in no way satisfactory.

Three orderlies are needed: 1 for night duty in the male surgical ward, 1 for service in the new clinical building, and 1 for the interne's residence.

A maid is also needed for night duty in the obstetrical wards.

Provision should be made for 2 residents: 1 for the surgical department and 1 for the medical. It is proposed to appoint physicians as residents who have served, with some distinction, as internes for at least 1 year in a class A hospital. The training of residents in special branches of medicine and surgery represents advance or post-graduate instruction for physicians whose ultimate aim is to prepare for the practice of a specialty.

THE SCHOOL OF NURSING

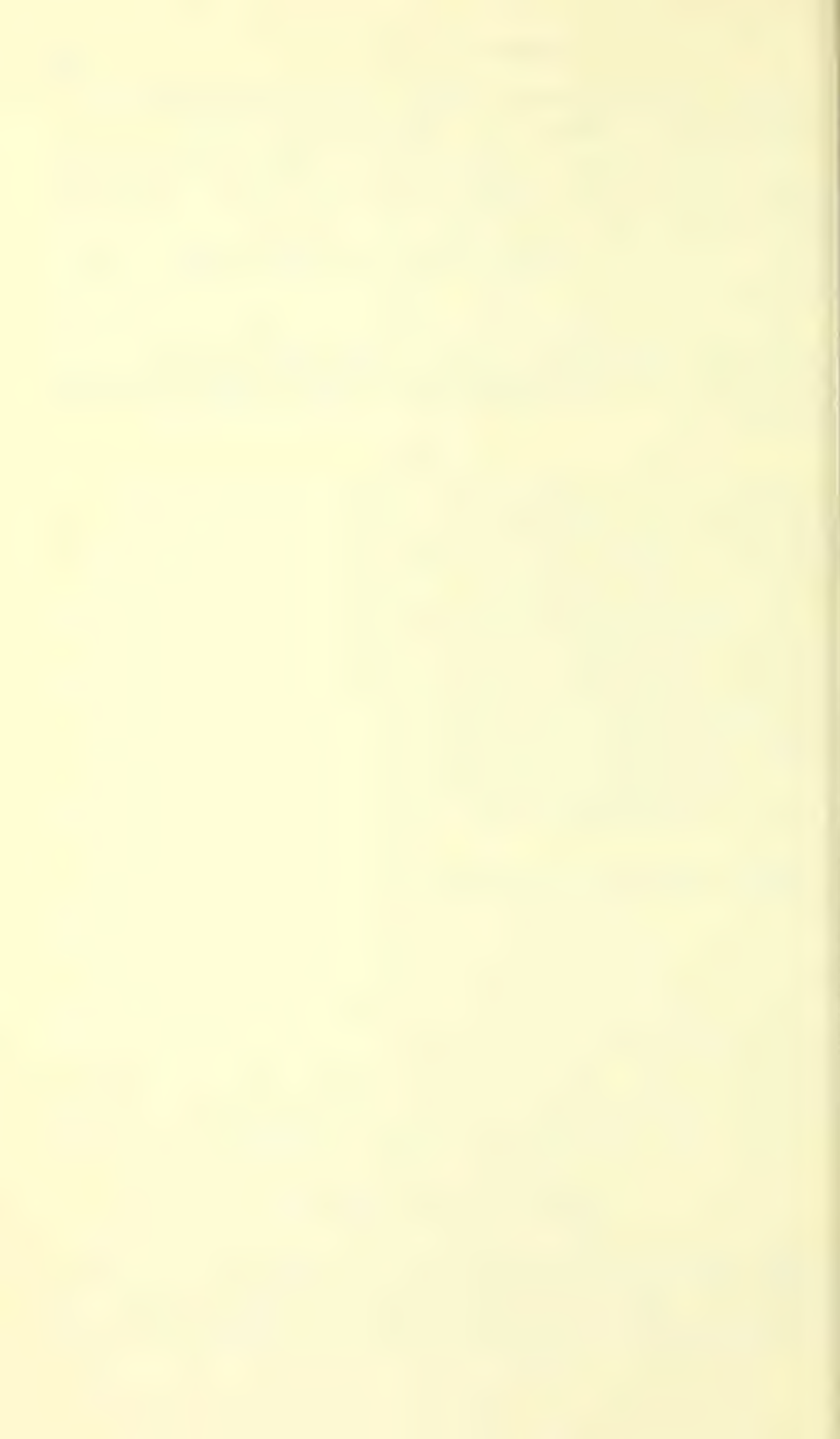
The demands for service in this department of the hospital were very heavy. The service rendered by the nurses was, on the whole, satisfactory, but there were many evidences of a need of a larger number of graduate nurses. This is regarded as very essential to

efficient care of the patients, satisfactory training of student nurses, and to reduce the hours of duty to a daily 8-hour basis.

The superintendent of nurses is of the opinion that 21 additional graduate nurses should be employed. In this opinion I heartily concur.

On account of the intensive theoretical program pursued by the first-year students, two additional instructors are necessary for teaching and follow-up work.

The graduating exercises were held June 4, 1935, in the Andrew Rankin Memorial Chapel of Howard University, at which time 28 nurses were graduated, making a total of 631 graduates from the school.



COLUMBIA INSTITUTION FOR THE DEAF

(PERCIVAL HALL, President)

During the fiscal year July 1, 1934, through June 30, 1935, there were under instruction in the advanced department of the institution, known as Gallaudet College, 81 men and 56 women, a total of 137, representing 36 States and the District of Columbia. This is a decrease of five as compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 34 girls and 38 boys, a total of 72. This is an increase of two as compared with the preceding year. Of the total in this department, 67 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 27 males and 31 females; discharged, 33 males and 22 females.

Excellent health prevailed among the students and pupils during the year. There were no deaths and no serious cases of illness. Four cases of appendicitis were successfully treated, 3 by operative and 1 by nonoperative methods.

A special course in world literature was added to the curriculum and a study made for future adjustment in connection with all courses given in the advanced department.

The increasing number of pupils and students in the institution shows still further the pressing need of a library and recitation building, which has been asked for by the secretary; also revision and improvement of the power house and heating and lighting system. In the near future the gymnasium should be remodeled and special appropriations made for the construction of a new primary plant.

Research work in the occupations of the deaf was conducted by normal students of the institution during the year, and a study of family background of former students was made by a deaf graduate student.

Particular attention is needed to the study of acquisition of language by deaf persons and the best methods of teaching English. This and other important research projects call for a research worker and assistant to be employed regularly by the institution. The increase of students calls, also, for the employment of an additional instructor.

Twenty additional scholarships were granted to the advanced department of the institution by Congress, making a total of 145 now available.

Receipts for the year were \$170,258.64; expenses, \$169,001.02.

On commencement day, 6 pupils of the Kendall School received diplomas, 6 members of the normal department received the degree of master of arts, 2 deaf graduate students received the degree of master of arts in course. The degree of bachelor of arts was conferred on 11 members of the senior class, and the degree of bachelor of science on 9.

THE ALASKA RAILROAD

(O. F. OHLSON, *General Manager*)

GENERAL REMARKS

The program of improvements and rehabilitation, consisting of ditching, bank widening, grade raising, ballasting, filling-in of wooden trestles, replacing wooden culverts with concrete pipe, placing rock to protect roadbed against erosion from rivers and streams, and making line changes to eliminate snowsheds progressed favorably.

INVESTIGATION AND DEVELOPMENT OF MINERAL RESOURCES

The Alaska Railroad continued actively to aid the mining industry by maintaining an office, with a mining geologist, through which, in cooperation with the Alaskan branch of the Geological Survey, prospectors, mine operators, and prospective investors are given what information is available. In connection with this aid a number of investigations of prospects, mines, and mineralized areas were made, and this information is available to the public.

Gold is the chief metal mined in the Railroad belt. With the continued stimulation of a \$35-per-ounce price, prospecting, development, and mining has been at its highest point since the World War. Numerous new gold placer mines have been started on properties that could not be worked at the old price of gold, and machinery is being placed on many claims that previously have been mined by hand. The installation of several new dredges is contemplated for the immediate future. Some promising new strikes have been made in districts that heretofore have been neglected. Several new gold-quartz mines have been added to the list of already producing mines.

The mining of base metals is at a low ebb, due to the continued low price of these metals, and an immediate prospect of these deposits contributing tonnage for the Railroad cannot be expected.

Early in the fiscal year 1935 the examination of the Eska coal lease, which is the Railroad's emergency coal reserve, was completed. As a result of the examination it was decided to drive a

new tunnel to open up coal beds containing a higher-quality coal. The project calls for approximately 1,500 feet of underground work, and was started about the 1st of August and continued until the middle of October. Work was resumed in June 1935 and will be completed in early December, this year. The new coal development will eliminate the flood hazard of Eska Creek, reduce mining and mine-maintenance costs, and will assure the Railroad of a continued fuel supply in the event of any emergency that may arise at the privately operated mines.

Late in the fiscal year 1935 a topographic and geologic survey of the Matanuska bituminous coal field between Eska and Moose Creeks was started. Ultimately this work will be of great value, not only for the development of the private mines, but will also enable the Railroad to ascertain the available coal reserves in this part of the field.

The Healy River Coal Co., in the Healy River coal field, and the Evan Jones Coal Co., and the New Black Diamond Coal Co., both in the Matanuska coal field, operated almost continuously throughout the year, and entirely supplied the Railroad and the commercial market with coal.

AGRICULTURAL DEVELOPMENT

A progressive stride in the colonization of Alaska was made when, during May 1935, 200 colonists with their families were transported to Alaska and installed upon land in the Matanuska Valley. This movement was initiated and sponsored by the Federal Emergency Relief Administration and later turned over to the Alaska Rural Rehabilitation Corporation.

The Railroad continued throughout the year to disseminate information on requests by prospective settlers, which were quite heavy due to press reports covering the Government project at Palmer. However, but few settlers acted upon the information furnished and located in the Railroad belt, due greatly to a lack of capital necessary to undertake such a venture.

TOURIST TRAFFIC

Tourist traffic increased over that handled the previous year, notwithstanding many cancelations received during the 1934 tourist year, caused by the Pacific coast longshoremen's strike. The great amount of publicity given to Alaska in recent months has greatly encouraged Alaska travel, and from the volume of business booked for the 1935 tourist season, it is indicative that travel to Alaska is continuing on an upward trend.

FINANCIAL

Revenue from all sources, including nonoperating income, was \$1,476,567.76, an increase of \$182,883.46, or 14.14 percent.

The operating ratio of the Railroad decreased from 117.26 percent in 1934 to 105.61 percent in 1935.

Total expenses for rail and water line were \$1,557,563.18, an increase of \$86,067.12, or 5.85 percent. Total deficit for rail- and river-line operation and including miscellaneous operations was \$73,674.66, a decrease of \$105,298.67, or 58.83 percent. From this should be deducted the amount of \$16,619.18 expended during the fiscal year for investigation of mineral and other resources, reducing the deficit to \$57,055.48.

There was an increase of 15,702 tons in amount of rail-line freight tonnage during 1935 over that of the previous year, with a corresponding increase in freight revenue of \$126,527.08.

The increase of 15,702 tons in freight tonnage was divided 8,051 tons coal shipments and 7,651 tons miscellaneous merchandise. The increase in freight tonnage is attributed to the expansion of the gold mining industry carried on adjacent to the line of the Alaska Railroad.

The number of rail-line revenue passengers carried increased 7,486 over that carried in 1934; rail-line passenger revenue likewise increased \$52,561.29 over the preceding year.

The pay roll for 1935 amounted to \$1,338,825.27, an increase of \$96,124.87 over the previous year. The increase in pay roll was due mostly to discontinuance of legislative salary deductions, and partly to increased tonnage handled during the fiscal year, requiring increased operating personnel.

GENERAL BUSINESS CONDITIONS AND OUTLOOK FOR
TRAFFIC IN FUTURE

The mining industry, having been stimulated during the year by a favorable gold price, may be expected under the current gold price to continue to develop and expand during 1935-36, thereby creating an increase in tonnage for the Alaska Railroad.

The colonization project in the Matanuska Valley, which created a large amount of tonnage for the Railroad during the latter part of the 1935 fiscal year, will resolve to a volume of traffic normally to be expected from a farming community of its size, on completion of the construction and development stages of the project.

There are no apparent indications, other than those mentioned, for any increases in general business in other lines for the coming fiscal year.



THE PERRY'S VICTORY MEMORIAL COMMISSION

(WEBSTER P. HUNTINGTON, President)

The Fifteenth Annual Report of the Perry's Victory Memorial Commission to the Secretary of the Interior for the fiscal year ended December 1, 1934, noted total receipts from operation of the Memorial during the season of 1934 in the sum of \$2,980.95, and total disbursements of \$3,062.70, the latter figure including accumulated indebtedness of \$1,440.25 carried over from previous seasons since the advent of the general business depression. The actual expenses on account of operation in 1934 were \$1,622.45. Receipts indicated an approximate increase of 17 percent over those of 1933, and actual expenses of operation a decrease of approximately 30 percent. This decrease, however, was accomplished at the sacrifice of proper care of the Memorial grounds as compared with previous seasons and reduced consumption of electric current for night lighting, thus affording only the minimum of protection to navigation and aviation within the financial resources of the Commission to provide. The increase in receipts was the first recorded in 5 years, or since the depression began.

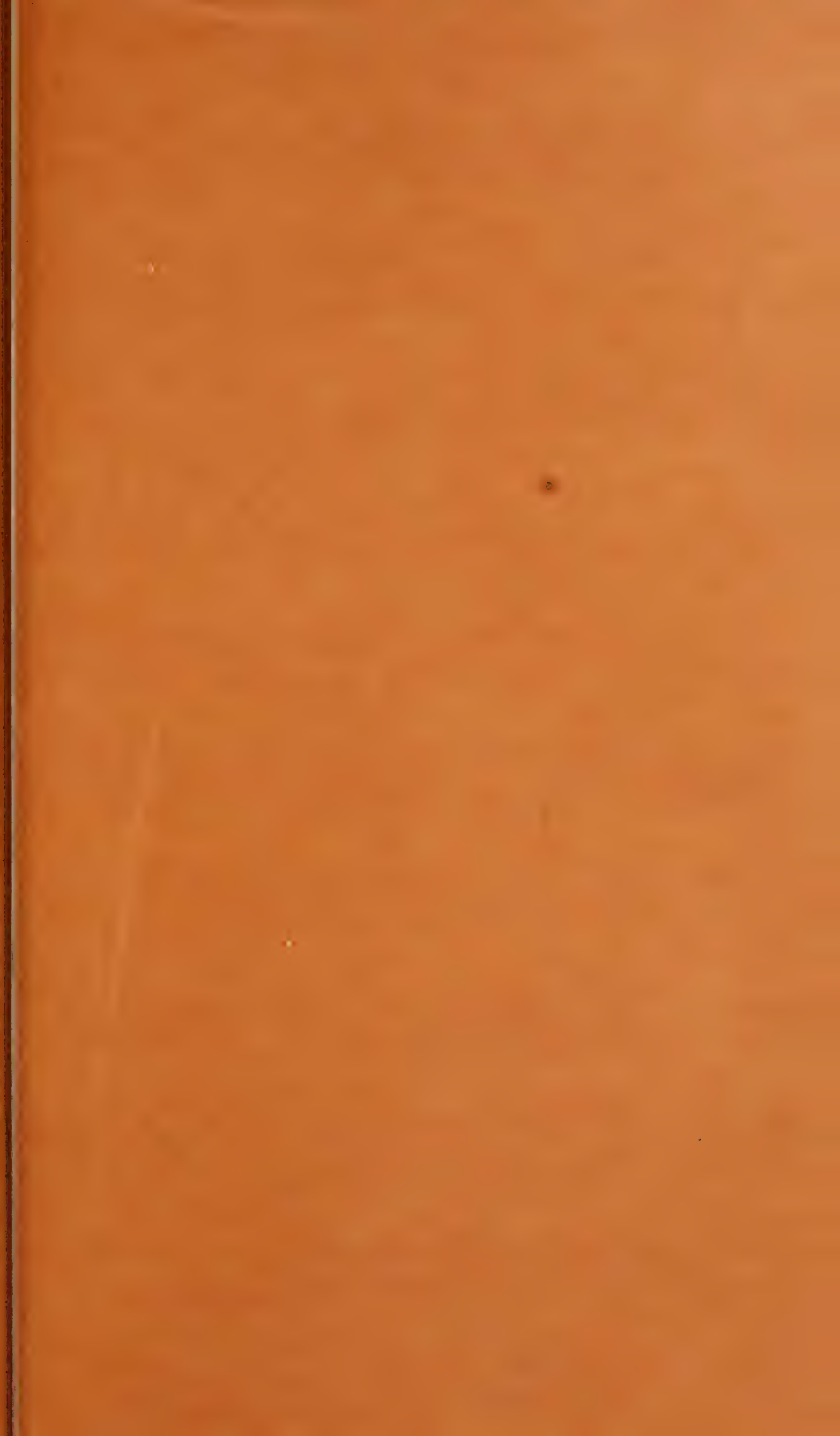
At the time of filing this summary (Aug. 29, 1935) indications are that a slight increase of receipts for the present season will be recorded over the season of 1934.

Within the year the Commission has concluded and paid for all contracts for improvements and repairs authorized by the grant of \$25,025 by the Federal Emergency Administration of Public Works, except two items thereof rescinded and the item of \$175 for repairs to the lightning-protection system of the Memorial, the latter still remaining in course of adjustment. The rescinded items were \$2,000 for expenses incurred in connection with the contract to change the drainage system of the Memorial and \$2,465 for expenses incurred in connection with the contract to install the electric lighting system, the allotted funds for both of which were returned to the United States Treasury. The chief allotment of the P. W. A. grant was \$18,400 for a new retaining and sea wall along the north shore of the Memorial grounds. The contract for this work was let for \$17,100, and the completed wall justifies the highest expectations in regard to it as a protection against erosion for many years to come.

Concerning the physical condition of the Memorial proper, its approaches and terraces, the Commission reports that it evidences no deterioration affecting the permanence of their construction.

At the late session of the Seventy-fourth Congress legislation was introduced seeking to transfer full control of the Memorial property to the National Park Service under the direction of the Secretary of the Interior and continuing members of the present Commission as constituting a board advisory to the national authorities. The identical Senate and House bills to accomplish this object failed of enactment. The Commission renews its former representations in support of such legislation in the hope and expectation that it will receive congressional approval at the coming session.





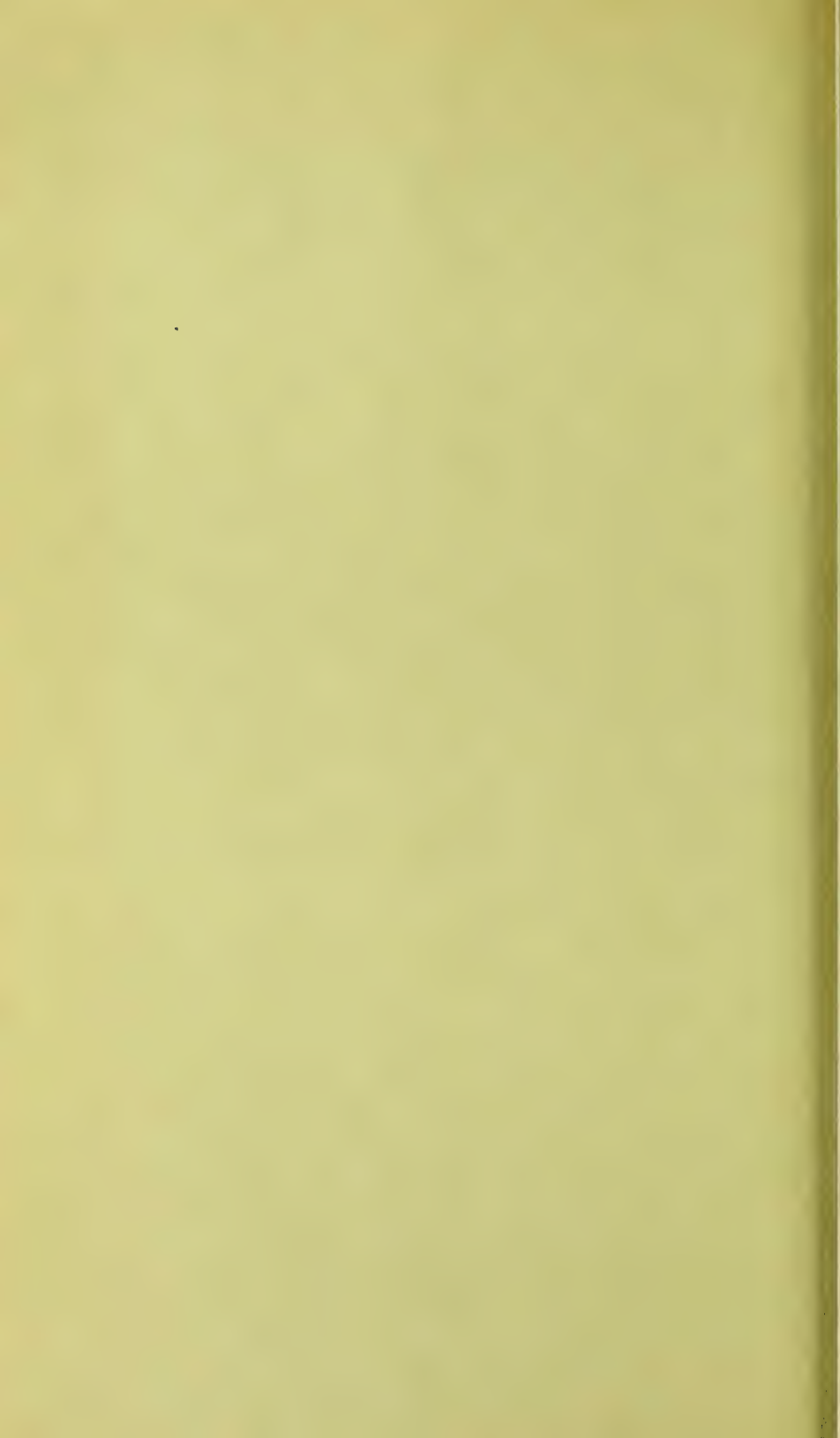


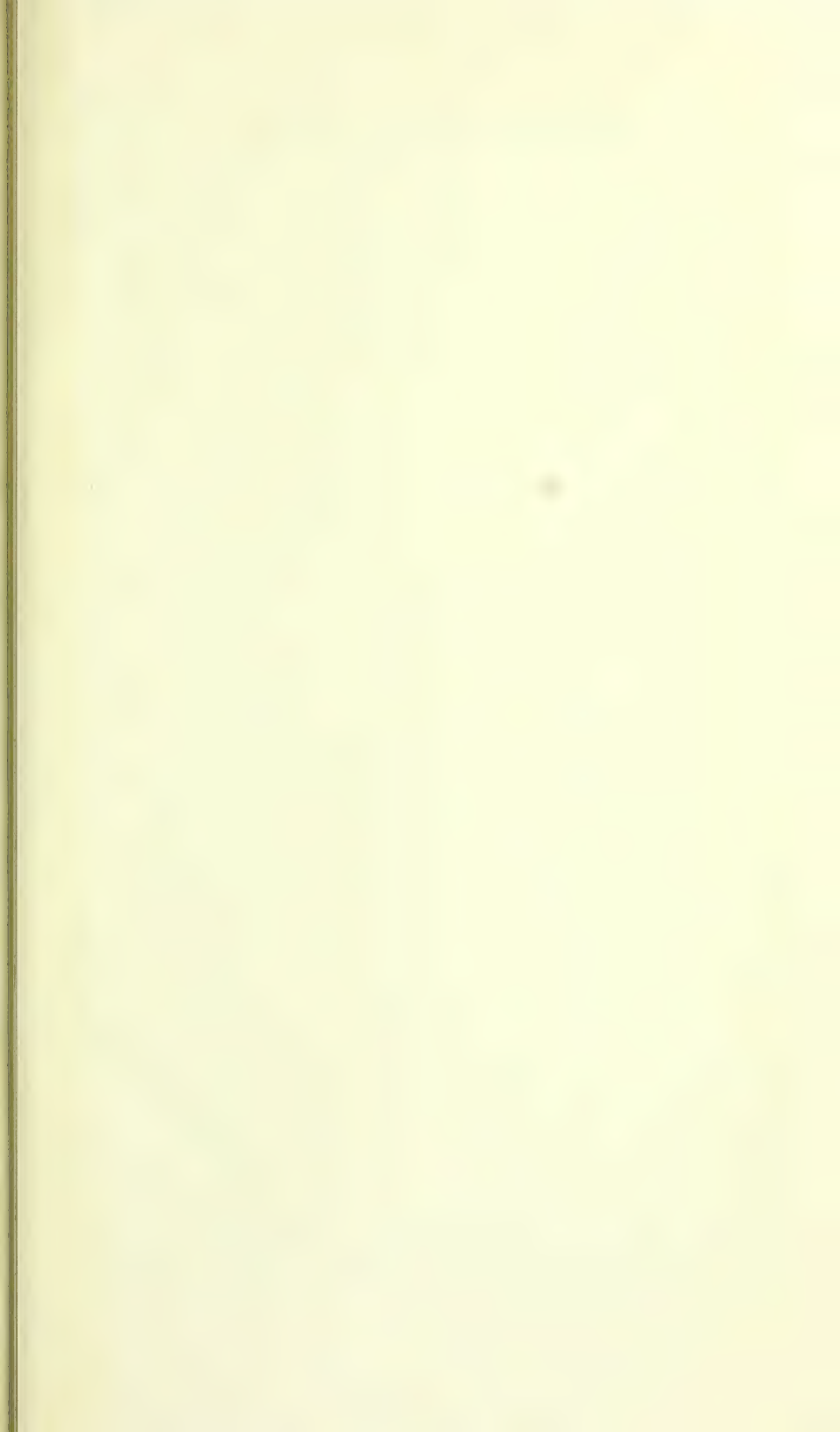
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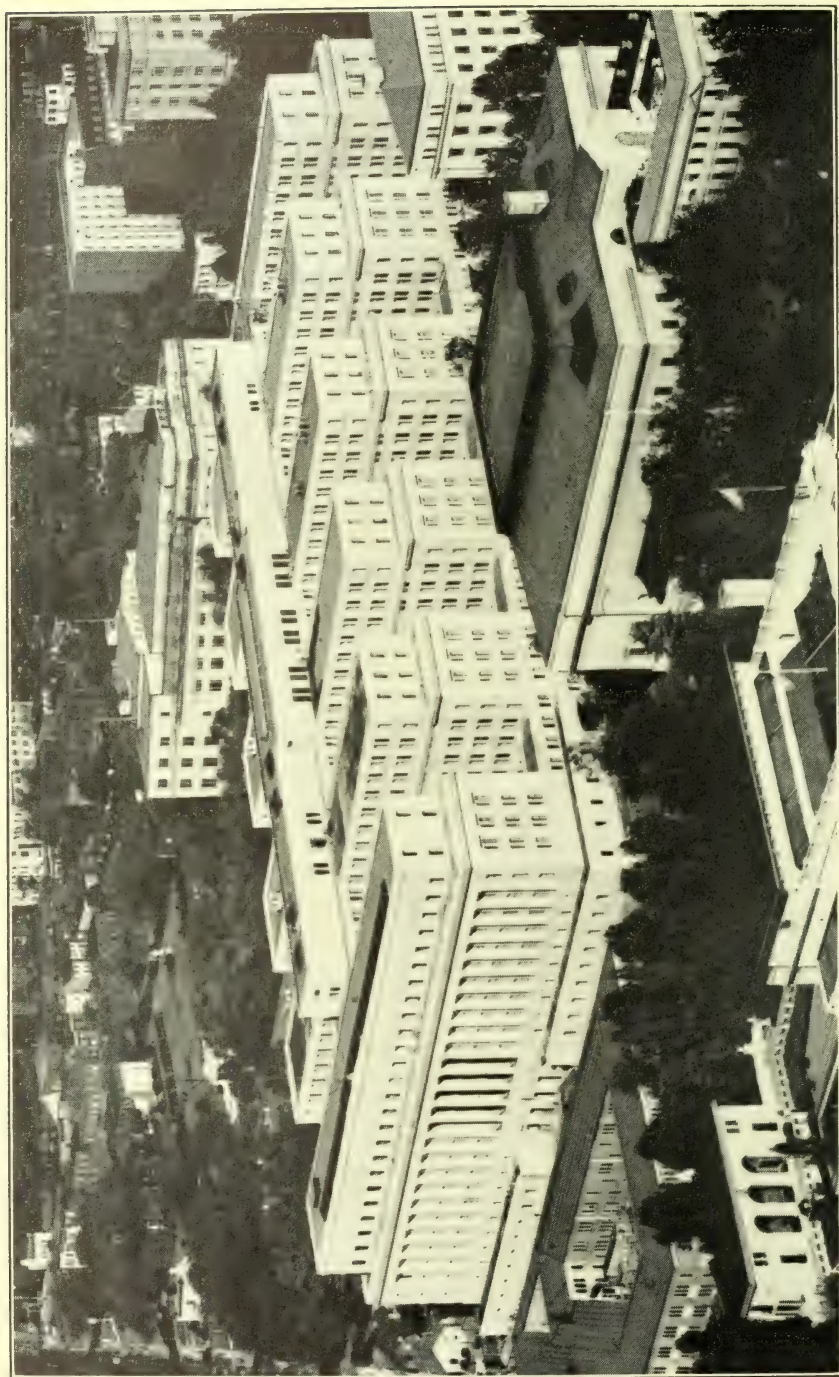


ANNUAL REPORT
OF THE
SECRETARY OF THE
INTERIOR

FOR THE FISCAL YEAR ENDED JUNE 30
1936







THE NEW DEPARTMENT OF THE INTERIOR BUILDING.

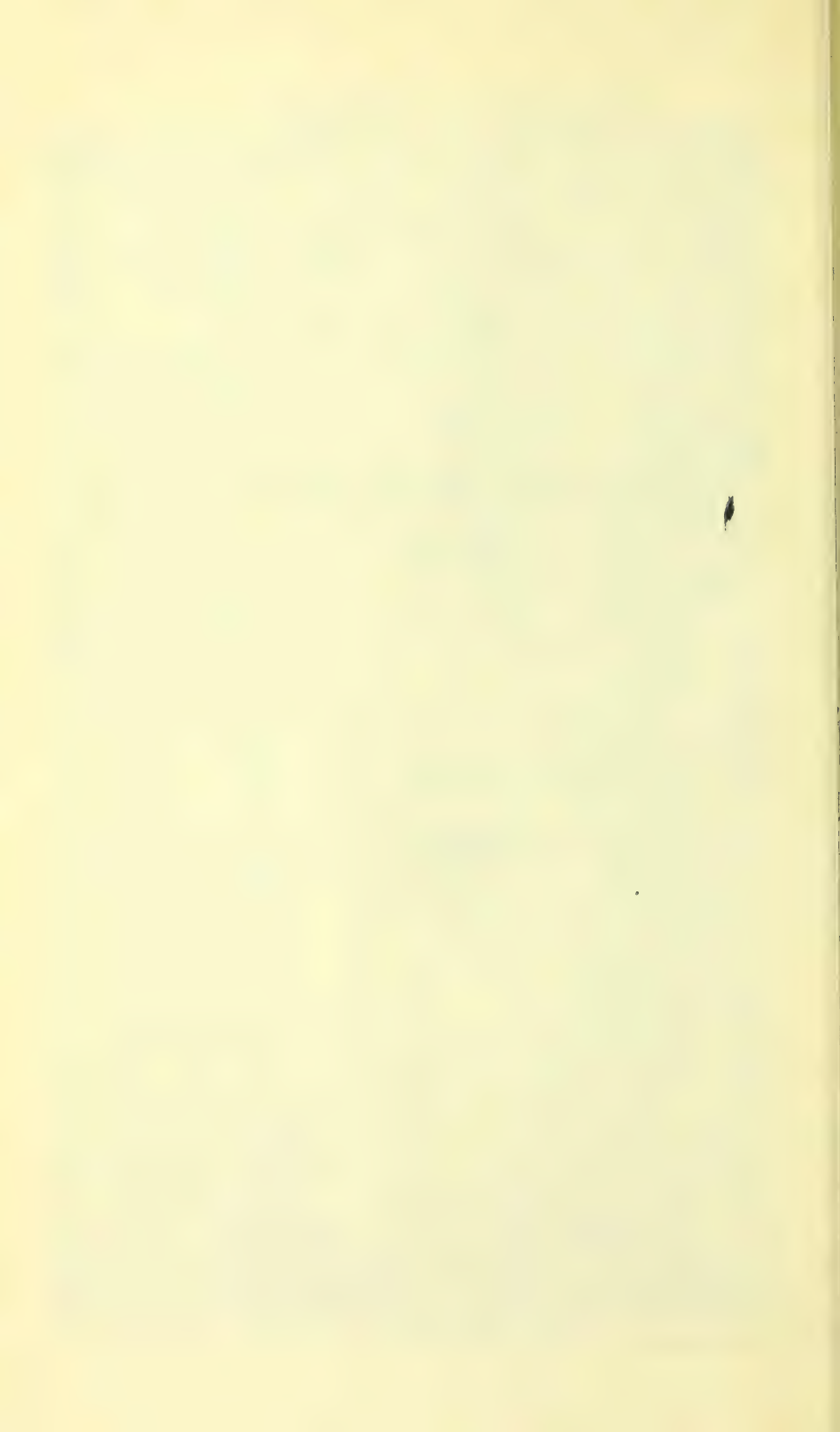
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FOR THE FISCAL YEAR ENDED JUNE 30
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UNITED STATES
GOVERNMENT PRINTING OFFICE
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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington.

MY DEAR MR. PRESIDENT: I have the honor to transmit the annual report of the Department of the Interior for the fiscal year ended June 30, 1936.

The work of the Department of the Interior is concerned predominantly with the custodianship of a vast national estate. More than 95 percent of the annual and permanent appropriations made for the work of the Department during the fiscal year 1936 are for taking an inventory of the natural physical resources of the United States, for undertaking the wise development and use of such resources, and for the education, health, and recreation of the people of the nation. It is a department of conservation—conservation of those physical and human resources on which depend the future of America.

Water, land, and minerals—these three comprise the base for a program of conservation of natural resources. Knowledge of their existence in quality, quantity, and location, followed by wise development of water resources, prudent use of land and its products, and orderly exploitation of mineral deposits, without waste, will insure a sound and permanent foundation for the material welfare of the citizens of the United States.

A RECORD FOR RECLAMATION

The advancement made during the year in the conservation of the waters of the arid West through the construction program of the Bureau of Reclamation by far outdistanced that recorded in any previous year. With the expenditure in the fiscal year of \$52,336,-329.32, operating projects were improved, new projects were completed for the protection and the creation of agricultural communities in the arid States, and several worthy, self-liquidating projects were launched. The employment provided in this undertaking was an important factor in advancing recovery throughout the West.

Boulder Dam was completed. The treacherous Colorado River was permanently harnessed for the benefit of the people of the Pacific Southwest. The threat of flood and drought was forever removed from the Imperial Valley of California.

In addition, three other dams, smaller, but in their districts not less important than Boulder Dam, were completed and put in service. Work progressed satisfactorily on nearly a score of dams designed by the Bureau of Reclamation to regulate and make useful the waters of as many streams from Washington to Texas.

But new and additional construction does not tell the whole story of reclamation for the year. It was a profitable and successful period for the operating projects. Reservoirs in use caught ample

waters for irrigation. Crops were good and crop prices were satisfactory.

Even with a new and severe drought developing as the fiscal year drew to a close, the prospects for the summer of 1936 on Federal reclamation projects were most encouraging. With two exceptions, reclamation reservoirs filled as the spring thaws ran off the mountainous watersheds. However, the shortages in prospect for these two projects apparently would leave them in no danger of disastrous crop losses. Proration of water would be necessary, but the areas to be served still would be in a position incomparably better than the unprotected dry regions that surrounded them.

The fiscal year of 1936, by its actual results, gave a new demonstration of the benefit to the West and the nation of our national reclamation policy.

OTHER NOTEWORTHY ACHIEVEMENTS

Among the achievements of this department during this administration was the successful organization and operation of the Grazing Division. Set up to curb overgrazing on public lands, this Division has operated differently than most Government bureaus. A system of self-regulation by stockmen under Federal supervision is working out to the benefit of some 142 million acres of public land as well as to the satisfaction of the users of the public domain. After a series of public hearings throughout the western grazing country, with the General Land Office, the Geological Survey and local stockmen cooperating, grazing districts were set up with local directors, and the program of conserving grazing land is now well under way.

The long period of exploitation of the American Indian has ended. The Wheeler-Howard Act made mandatory a complete change in Indian policy. Until this reform, two-thirds of the 139 million acres owned by Indian tribes in 1887 had been lost, tribal bonds had been disrupted and an increasing number of Indians had been rendered landless. The Wheeler-Howard Act prohibits the sale of Indian lands except to the tribes. It provides for consolidation of Indian lands. It sets up a process which enables Indians voluntarily to return their individual landholdings to a tribal status.

There is no compulsion upon any Indian tribe or reservation to accept the benefits of the Wheeler-Howard Act. Each tribe is given the privilege of deciding by an election whether it wants to accept or reject the advantages offered. Thus far, the great majority of tribes have enthusiastically voted for the new policy.

Since the death of the petroleum code, the Connally Act has made it possible to check overproduction of this valuable and irreplaceable resource. The Petroleum Conservation Division now is carrying on this work. This administration is the first to undertake any Federal regulation of petroleum.

Consolidation of all Federal park activities under the National Park Service by Executive order has brought about, for the first time, a unified administration of the various national parks and monuments. The Congress has empowered the Secretary of the Interior to designate outstanding historic sites for preservation by the Nation. A Branch of Historic Sites and Buildings has been set up in the National Park Service under an assistant director.

THE INVENTORY OF LAND, WATER, AND MINERALS

Surveying and platting, examination and classification of the public and Indian lands; geologic and topographic surveying and mapping of the country; examination of the geologic structure, the mineral resources and products of the national domain; gaging streams and determining the water supply of the Nation and reporting on the best methods of utilizing water resources; and making statistical reports on the mineral resources of the United States and of the world have long been functions of the Department.

An inventory of the natural resources of America is being made. The task is great, appropriations are relatively small, and the work proceeds slowly. Since we must know what and where our resources are before a comprehensive plan for their utilization can be made and, since intelligent planning must precede wise development and prudent use in the interest of conservation, there should be a speeding up of stock taking so that it will be completed within a short span of years. Segments of an accelerated program of inventory taking have been authorized by the Congress, but so far no appropriation has been made.

DEVELOPMENT OF WATER RESOURCES

Selection of sites for reservoirs and other hydraulic works necessary for the storage and utilization of water for irrigation and the prevention of floods and overflows; the development of water-supply systems for domestic use, power, irrigation, and other beneficial uses on Indian lands or for the Indian people; and the construction of irrigation systems and regulating reservoirs, often with incidental development of water-power in the public-land States constitute a major function of the Department and have played an important part in the upbuilding of the West by the pioneers and their descendants.

Private development of water resources affecting the public lands for irrigation, domestic purposes, power, mining, and other beneficial uses, under the auspices of the Department, has paralleled the development through public funds, although since 1920 the Federal Power Commission has had jurisdiction over the major portion of the new developments of water powers, in cooperation with this and other interested departments.

The most spectacular of the accomplishments of the year was the completion of Boulder Dam, an unprecedented event in the annals of engineering. No longer can floods from above Grand Canyon threaten devastation to the fertile lands and costly improvements of the Yuma and Imperial Valleys. The turbulent waters of the Colorado will be stored in a peaceful reservoir, Lake Mead, whence, as needed, they will be discharged to develop hydroelectric power, to irrigate hundreds of thousands of acres of arid lands and to augment the domestic water supply of the metropolitan district about Los Angeles.

PROGRESS OF GRAND COULEE

Substantial progress has been made toward the completion of two other vast projects for the utilization of the water resources of the

West. The foundation abutments of Grand Coulee Dam, key structure of the Columbia Basin project in the State of Washington, have been built, and surveys and plans for the Kennett and Friant Reservoirs of the long-dreamed-of Central Valley project of California are well under way. Many other surveys, investigations and construction projects for the further conservation and use of the water resources of the public lands have been completed or are in progress. Proof of the soundness of the policy of reclaiming the arid lands of the West lies in the results obtained from Interior Department projects. In 1936 about 2,900,000 acres of land raised irrigated crops of a value of nearly \$107,000,000.

Water supplies of the public domain have been supplemented by the addition of 2,240 acres to the public water reserves; by the acquisition of 100 wells drilled by the Utah Drought Relief Commission; by the drilling of 26 wells and the constructing of 152 water holes and small stock reservoirs and the laying of 27,000 feet of pipe line as part of an emergency conservation work program; and by the conditioning as water wells of 3 wells drilled for oil or gas.

Supervision was exercised over 172 power projects under permit or grant by the Secretary of the Interior and 145 projects of the Federal Power Commission.

UTILIZATION OF MINERAL RESOURCES

Until recent years the national policy for mineral resources of the public lands involved only exploitation by private interests. The leasing of restricted Indian lands for minerals has long been the practice, and within the last two decades Congress adopted a policy of leasing public lands for the production of coal, oil and gas, oil shale, phosphate, potash, sodium, and, within limited areas, of sulphur, gold, silver, and quicksilver. This has brought to a practical end private acquisition of lands containing these important minerals.

The act of August 21, 1935, constitutes an important forward step in the leasing policy for oil and gas that will reduce materially speculative operations using the public reserves as a base. It will also provide for a more business-like development of the oil and gas resources of the public lands, and will result in a return to the Government of a proper share of the value of the mineral production. Under this act, the proceeds of public-land mineral development will be returned to the States from which they are produced, in part, directly, for the support of schools and roads and in part, indirectly, through Federal construction of irrigation systems. Helium, alone, is reserved for exclusive exploitation by Federal agencies for governmental purposes. Mineral production under the supervision of the Department in 1936 had a value of about \$70,000,000.

Supervision of the exploitation of publicly owned mineral resources to assure an orderly development and the maximum practicable ultimate production without waste and with due regard to the safety and welfare of miners and others is an important conservation activity of the Department.

COORDINATION OF OIL AND GAS CONSERVATION

On March 31, 1936, there was established in the Department a Petroleum Conservation Division to assist in coordinating all oil and gas conservation activities of the Department as well as to supervise operations for the control of interstate and foreign commerce in oil and oil products under the act of February 22, 1935 (49 Stat. 30).

Research in production and in processing methods, dissemination of information with respect thereto, and education in mine-safety rescue and first-aid methods conducted by the Department is an allied activity of great importance and value to the mineral industries.

One hundred and ten patents to mining claims were issued in 1936 under the lode and placer laws and 270 contests regarding such claims were disposed of, showing that interest still persists in prospecting for and developing the metalliferous minerals of the public domain. Under the mining laws a claim may be taken up and all the minerals therein mined and disposed of without notice to the Department. Only when an application for a patent is made is the claim made of record in the United States Land Office and then, if discovery has been made, title to the land passes from the United States on payment of a nominal fee. Particularly now that most of the land of the public domain is dedicated to some public purpose or is under some system of administration, is such a method of handling mining claims unbusiness-like and contrary to the public interest. Some simple system of permitting the discovery and development of minerals under a prospecting permit and lease subject to supervision that would protect the public interest without hampering the operations of the permittee or lessee would mean a forward step in mineral-land administration. Minerals still on Indian lands are subject only to a lease under a system that works well. Its extension to the reservations of the public domain is recommended.

INCREASE IN MINERAL-LEASE BUSINESS

The mineral-lease activity on the public domain, which normally grows at the rate of about 10 percent a year, showed an increase of about double that amount both in production and revenue in 1936. Receipts for the year from mineral leases aggregated about \$4,444,000 of which 37½ percent were payable to the States in which the producing areas were located and 52½ percent were covered into the reclamation fund. It is believed that values fully as great were saved through the activities of the supervisory forces cooperating with the operators. This is practical conservation.

Of unusual importance are oil and gas. About 15 percent of the Nation's petroleum reserves are believed to be on the public domain, but production has been held down to about 3.8 percent of the total for the United States during a year of continued surplus of producible oil.

Noteworthy progress has been made during the year in the promotion of unit operation for fields in which lands of the United States are an important factor. By the end of the year no less than 800 such plans had been filed for consideration. Twenty of these were approved and are now in force, and 186 were withdrawn or rejected.

The remainder were in various stages of consideration or revision. The object of unitization is that of more properly conserving the oil and gas resources involved, and it is the consensus of opinion in the industry that greater ultimate production at less cost will be the result of changing from individual operation of the several holdings in a unit field to operation under a cooperative or unit agreement. State control of the quantity of production has been materially strengthened during the year by a denial under Federal law of interstate or foreign commerce in oil produced contrary to State laws and regulations.

Production of oil and gas from Indian lands amounts to between three and four percent of the nation's total, while production from naval petroleum reserves, also under supervision of the Department of the Interior, amounts to about 0.4 percent of the aggregate. Though retention of oil in the ground is the national policy with respect to the naval reserves, some production is forced by operations on interspersed private lands. Such production is diminishing year by year.

Production of coal on the public domain increased about 12 percent during the fiscal year 1936 and constituted about 1.1 percent of the output for the United States. Much effort is put forth to secure the adoption of plans and methods that will assure the maximum ultimate production. Successful efforts of the Department in behalf of safety are attested by the fact that the death rate from explosives in mines has been reduced 90 percent in the last 30 years; that during the last 5 years mines in the United States have had the lowest accident rate in their history; that the accident rate in mines under the supervision of the Department is materially lower than in mines not on Government lands; and that of 51 awards to bituminous coal mines or operators by the Joseph H. Holmes Safety Association for the calendar year 1935 two were to departmental lessees. Cooperation of operators in accomplishing these results is gratefully acknowledged.

Further development of potash mines on lands of the United States until they are capable of supplying the entire needs of the country is worthy of special mention. Production on Indian lands of lead to the extent of 3.1 percent and of zinc to the extent of 10.4 percent of the Nation's total is also an item of importance.

MINING AND REFINING RESEARCH

Research on mining and refining methods and practices in the fiscal year resulted in the approval of 18 devices for use in mines and the addition of 25 new explosives and 3 new models of a blasting device to the permissible list; the development of a new methane indicator; the perfecting of a new method of extracting manganese electrolytically; the demonstration of several methods of treating domestic chromite ores; the development of a method of gaging capacity of gas wells with minimized waste; the improvement of methods of purifying clay, feldspar, and other low-grade nonmetallics by froth flotation; the perfection of a method of determining minute quantities of benzol in blood and urine; and the discovery that silica is an important factor in caustic embrittlement in steam boilers. Eight thousand samples of coal and coke were analyzed. Bearing strength

and plasticity of potash salt, applicable particularly to mines now operating on Federal land, was determined; various substances for use in rock-dusting mines were tested; studies of Diesel locomotives were concluded; and helium was produced and furnished for the spectacular stratosphere flight conducted by the National Geographic Society and the Army Air Corps.

LAND SURFACE—ITS PROTECTION AND USE

The Federal landed estate outside of Alaska has dwindled from a billion and a half to a little more than 400 million acres, or about a fifth of the total area of the 48 States and the District of Columbia. Thirty-five percent of this remainder is or will be included in grazing districts, 34 percent is within the existing boundaries of national forests, more than 14 percent is in Indian reservations, over 2 percent, together with about an equal area donated by States and private citizens, is in national parks and monuments, over 7 percent is in military, naval, and miscellaneous reservations or in areas withdrawn for public purposes, and nearly 7 percent is unappropriated public land withdrawn from entry but available to satisfy outstanding grants and for other purposes.

Further grants of public lands under existing legislation are virtually at an end, although there remain for settlement outstanding grants and unperfected public-land entries aggregating between 15 and 20 million acres. The final disposal of lands in these categories and the exchange of other lands and the consolidation of holdings will present problems for solution for a number of years. Administration of the remaining national estate under enactments by Congress constitutes the principal public-land activity now in prospect. The four main questions of administration of nonmineral lands are concerned with forage cover, forest cover, parks, and Indians. The problems involved should be coordinated to the greatest possible extent in order that the estate as a whole shall be of maximum benefit to the Nation.

The administration of the Indian lands has ever been an important item in the Department's guardianship of the American aborigines. The development of a system of Federal national parks and monuments of outstanding scenic, recreational, and historic value has been and is the work of the Department of the Interior. After more than 50 years of advocacy by this Department, the Congress, in 1934, adopted a program of administration, conservation, and rehabilitation for the vast area of public grazing lands under the jurisdiction of the Secretary of the Interior. The only major land-administrative activity that is not now, though it was originally, within the jurisdiction of this Department is concerned with the lands within national forest boundaries. According to reports of the Forest Service, more than half the area within these boundaries is not available as a source of merchantable timber and is considered to be chiefly valuable for grazing and the maintenance of a useful forage cover. The administration and use of such lands should be coordinated or combined with those of the far greater area of lands of similar general character in grazing districts under the jurisdiction of the Department of the Interior.

TWO NEW NATIONAL PARKS

Visitors to national parks and monuments for the travel year that ended September 30, 1935, numbered 7,676,400, an increase of 21 percent over the preceding period. The new Shenandoah (Virginia) and Mammoth Cave (Kentucky) national parks were admitted to the system. Areas of several other national parks and monuments were increased, and 11 new national monuments and other historic areas were conditionally authorized by Congress. Allocation of \$705,000 from an emergency fund was made for the acquisition of lands within the area of the proposed Isle Royale National Park in Michigan, on which to provide work for C. C. C. camps in cooperation with the Department of Conservation of the State of Michigan. A nation-wide survey of historic buildings and sites and a comprehensive study of public parks and recreational area programs and possibilities in the United States were initiated. Forty-six recreational demonstration projects in 24 States, readily accessible to 30 million people, were undertaken in cooperation with agencies outside of the Department, and nearly half a million acres are being acquired for this purpose.

The land-recording activities of the year included the receipt of original entries, selections, and filings for 425,834 acres; final entries for 1,937,529 acres; issuance of patents for 2,216,684 acres and certification of 253,903 acres under State grants—leaving 16,862,271 acres in unperfected entries at the close of the year. Under the Taylor Grazing Act there were received 19 applications for exchange of private lands, 261 for that of State lands, and 266 applications for sale and 2,255 for lease. All this in addition to applications for grazing rights within grazing districts.

EFFORTS TO SAVE THE PUBLIC RANGE

The grazing act of June 28, 1934 (48 Stat. 1269), as amended on June 26, 1936, sets aside 142 million acres of public land to be divided into grazing districts and provides for their orderly use, improvement, and development in order to stabilize the stock industry on the public range. By the end of the fiscal year 1936, 37 such districts, including a gross area of about 200 million acres, of which about 80 million acres were public land, had been created and more than 15,000 licenses for the grazing of more than 8,396,000 animals had been issued. Nominal fees of 5 cents per month for cattle and horses and 1 cent per month for sheep were adopted for present purposes, and \$48,271 in fees were collected during the year. Thus were initiated control of the public range and conservation of its soil and forage cover in the interest of the stock industry and for all useful purposes that the range lands might serve.

The aid of the stock industry itself in initiating, developing, and administering this wholesome national policy was assured by the election from the stockmen of 523 district advisors to work with officials of the Department. A program of range improvement was undertaken involving water development; construction of trails, bridges, fences, and cattle guards; control of rodents and insect pests; eradication of poison plants; protection against erosion as well as other work designed to make the range more useful. With the in-

crease of the public-land area available for grazing districts to 142 million acres by the act of June 26, 1936, it is anticipated that upwards of 400 million acres will be included within the boundaries of grazing districts within a year on request of the users of the range. This area, together with some 80 million acres of grazing lands within national forests, will make nearly half a billion acres capable of orderly regulation for grazing.

HUMAN WELFARE

The Department of the Interior is charged with responsibility for an internationally known hospital for the treatment of mental diseases, a hospital administered and operated by a staff almost exclusively of the Negro race, and other hospitals for care of the Indians that have a total capacity of about 5,000 beds.

In the field of education the Department maintains an institution for instruction of the deaf, including a department that offers the only educational program in the world for the higher education of the deaf, and a department for the training of teachers of the deaf; a university for the higher education of the Negro race; and many day schools, boarding schools, vocational schools, and colleges for the instruction of the Indians.

The Department, through the Office of Education, also conducts research into and disseminates information regarding foreign and domestic methods and systems of education, promotes vocational education, and administers substantial grants to educational institutions for the benefit of agriculture and the mechanic arts.

Under the heading of human welfare should be mentioned mine health and safety activities and the widespread recreational facilities afforded by public park and parkway systems. An earnest effort was in progress during the year to expand and coordinate all existing public facilities for recreation and outdoor sport. In 1936 literally millions of the citizens of the United States enjoyed fishing, hiking, horseback riding, boating, swimming, skiing, mountain climbing, and other outdoor activities in natural wilderness areas of unusual importance administered by the Department of the Interior. These recreational areas are supervised by employees trained to educate the visitors concerning the birds and animals, plants and trees, as well as on matters of historical, geological, and archeological interest.

NEW DEAL FOR INDIANS

Just prior to the beginning of the fiscal year the Congress passed the Indian Reorganization Act, already referred to, which makes provision for the economic rehabilitation of the Indian, for the organization of the Indian tribes so as to manage their own affairs, and for the civic and cultural freedom and opportunity of the Indian. Outstanding among the social-welfare activities of the year has been the progress made under and in line with this act. More than two-thirds of the Indian tribes have accepted this legislation, and constitutions for the governance of tribal affairs have been approved or are in process of being perfected. Already profound changes are taking place in Indian communities through the increased interest of the Indian in his social and economic affairs.

TERRITORIES AND ISLAND POSSESSIONS

The Division of Territories and Island Possessions exercises supervisory functions in connection with the Federal Government administrations of Alaska, Hawaii, Puerto Rico, the Virgin Islands, Baker, Howland, and Jarvis Islands; also the Alaska Railroad, Alaska Road Commission, Alaska Reindeer Service, Alaska Insane, Puerto Rico Hurricane Relief Loan Section, Hawaiian Homes Commission, the Virgin Islands Co., and the Government-owned Bluebeard Castle Hotel, St. Thomas, Virgin Islands.

Through the Puerto Rico Reconstruction Administration, Puerto Rico Hurricane Relief Loan Section, the Virgin Islands Co., Alaska Rural Rehabilitation Corporation, and the Hawaiian Homes Commission, long-range programs and policies for the improvement of economic and social conditions in the respective territories and possessions are being effectively carried out under the general supervision of the Division.

A comprehensive reconstruction program is now well under way in Puerto Rico, covering rural rehabilitation, rural electrification, slum clearance and housing, reforestation, and construction of public buildings. This program is being administered by an agency independent of the Interior Department. Loans made by the former Puerto Rican Hurricane Relief Commission are now in process of composition and adjustment as authorized in Public Resolution No. 60, Seventy-fourth Congress, approved August 27, 1935.

The Matanuska colonization project, under the direct supervision of the Alaska Rural Rehabilitation Corporation, during the second summer just passed has demonstrated that it is solidly established. The ultimate effect of this development upon the economy, conditions of living, and population of the Territory, cannot be over-estimated.

In the Virgin Islands, the sugar and rum industries are being restored to the important position they once held. Handicraft is being encouraged, small industries are being built up, and the tourist trade developed. Thanks to the policy of this administration, there is virtually no unemployment in the Virgin Islands.

The recently reorganized Hawaiian Homes Commission is proving to be energetic and enthusiastic in the discharge of its duties and there is every reason to believe that its businesslike management and vigorous enforcement of policies and regulations will prove beneficial to the Hawaiian people and assure the perpetuation of the race.

Quarterly expeditions out of Honolulu, T. H., are conducted in connection with the colonization projects on Baker, Howland, and Jarvis Islands, and valuable scientific data for use in connection with anticipated development of air routes to the South Seas, New Zealand, and Australia is being compiled.

In Hawaii the rehabilitation of the Hawaiian race is going forward under new legislation and a new commissioner. A survey of possible water supplies for irrigation on the island of Molokai has been authorized.

CONCLUSION

Reports of the several bureaus and other administrative agencies of the Department, setting forth in detail the operations under their

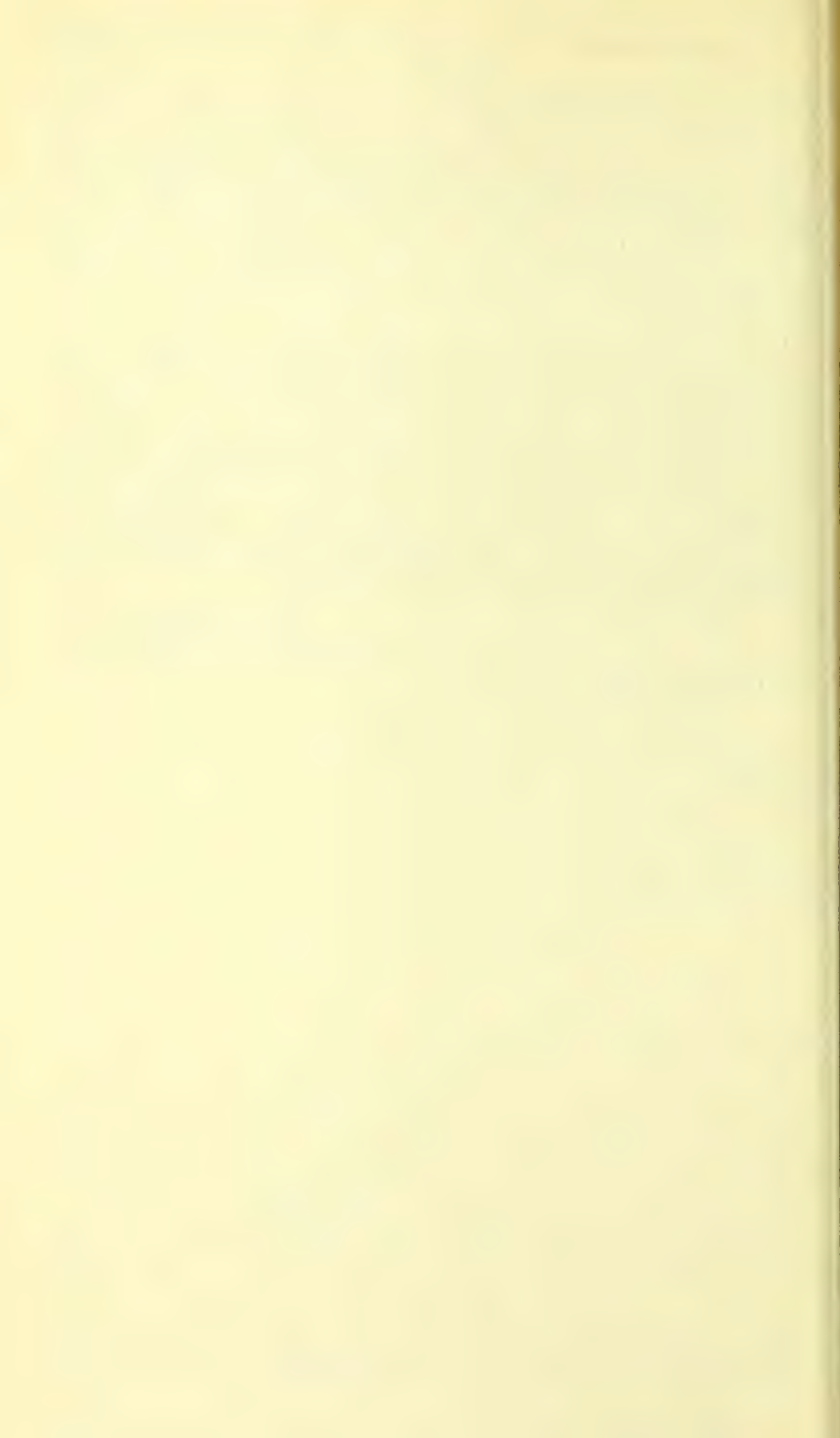
jurisdiction, are submitted herewith. All lead to the conclusion that the conservation of water, land, and minerals, with due attention to specific problems of human welfare, is soundly established as the major departmental policy. Substantial progress in each and every activity is recorded. Many of the accomplishments of the year were made possible only through the financial or personnel aid of the Public Works Administration, the E. C. W. camps, the Resettlement Administration, the Works Progress Administration, and other agencies whose objective has been to relieve unemployment through the performance of useful work.

Once again I commend to your consideration the desirability of changing the name of the Department of the Interior to that of the Department of Conservation—a name more expressive of its fundamental purpose and nature. Such a designation would give conservation an authority heretofore lacking, it would promote an increased consciousness of conservation as a Government policy, not only in the minds of officials but among the people of the United States generally, and it would place upon the personnel of the Department a definite responsibility for advancing the cause of conservation to the end that the resources of the United States may be used for the maximum benefit of every citizen of the country.

Very respectfully,

HAROLD L. ICKES,
Secretary of the Interior.

THE PRESIDENT,
The White House.



REPORT BY DIVISIONS AND BUREAUS

THE SOLICITOR

NATHAN R. MARGOLD

The immediate staff of the Solicitor was reduced from 21 to 19 regular members during the course of the past fiscal year. However, five attorneys have been specially assigned to this staff for the examination of land titles in connection with land acquisitions which are a feature of the Indian reorganization program. Otherwise, there has been no noteworthy change in legal personnel either in Washington or in the field.

The tasks of the immediate staff of the Solicitor have included the representation of the Secretary of the Interior and, in two important cases, the Federal Emergency Administrator of Public Works in litigation in the District of Columbia, the drafting of proposed legislation and reports thereon, the representation of the Department before congressional committees, the preparation of land decisions and departmental opinions and findings, the handling of the legal features of Indian reorganization and the disposition of such miscellaneous legal matters as are involved in the business of the Department.

During the past year the Solicitor has represented the Secretary of the Interior in various actions contested in the courts of the District of Columbia. The Department has prevailed in six such cases in the Court of Appeals for the District of Columbia and has been defeated upon but two occasions. Three of these controversies concern public lands, three were war minerals relief cases, one was a matter of Indian enrollment, and one arose out of the administration of a reclamation project. The two cases in which the Solicitor has represented the Federal Emergency Administrator of Public Works have involved the vital question of the constitutionality of basic features of the low-cost housing and slum-clearance program of the Public Works Administration. The issues in controversy have yet to be decided by the Supreme Court of the United States.

In the Supreme Court of the District of Columbia 62 war minerals relief cases were disposed of by dismissal or by entry of consent decrees. There remain of record in that court 78 war minerals relief cases, the disposition of which has been delayed by the failure of the local courts to decide definitely the question whether the

rights claimed survive the death of the claimant or the dissolution of a claimant corporation. However, the fact that during the session just ended Congress legislated with reference to the abatement and transferability of war minerals relief claims (sec. 2 of act of June 30, 1936, Public, No. 847, 74th Cong.) will undoubtedly speed the ultimate disposition of the pending cases.

A quantitative summary of the work, other than litigation, disposed of by the Solicitor and his immediate staff during the past year, is embodied in the following table:

	Land decisions	Opinions of Solicitor	Indian matters	Miscel- laneous matters ¹
Pending July 1, 1935.....	315	77	206	239
Received during year.....	1,600	490	7,839	11,117
Total.....	1,915	567	8,045	11,356
Disposed of during year.....	1,479	334	7,910	11,083
Pending June 30, 1936.....	436	233	135	273

¹ "Miscellaneous matters" include such transactions as the following: Contracts for the erection of buildings, road construction, supplies, etc.; reports on legislation; grants, transfers, and cancellations of mineral leases and permits; contracts with irrigation districts; grants and acquisitions of rights-of-way for power lines and for ditches and canals; withdrawals and restoration of lands; determination of power rates.

It will be noted that public-land cases and miscellaneous submissions for opinions of the Solicitor continue to increase in number. The number of such matters received during the year ended June 30, 1936, represents an increase of about 50 percent over the number received during the preceding year.

Of the 334 opinions rendered, as contrasted with 237 during the preceding year, about one-third were accident cases and 99 were title opinions. The number of title opinions is not an index to the volume of title work since the usual title opinion involves numerous tracts of land, each with a distinct chain of title. While the problem of title examination in connection with the numerous acquisitions of land under the Wheeler-Howard Act is less acute than a year ago by reason of the recent special assignment of five attorneys to this office to aid in this work, the prospective doubling of the Indian land purchase program during the coming year makes it doubtful whether the title section has been augmented sufficiently to dispose of this work with dispatch. Moreover, no additional attorneys have been provided to assist in the examination of the numerous titles involved in purchases by the National Park Service under its expanding program for providing new park and recreational facilities. With more than 100 title cases from all sources pending at the end of the year and with the anticipated increase of such work it will prove increasingly difficult for the present staff of title attorneys to keep pace with the land acquisition sections of the Indian Office and the National Park Service.

In addition to these special categories, requests for opinions have covered the usual broad range. As the statutes under which various bureaus of the Department act multiply with every session of Congress and the enterprises of the Department become more numerous and varied, the interpretation of statutes and their exposition in relation to particular undertakings becomes a larger task. Each year the variety, as well as number, of questions submitted for opinion witnesses the importance and the manifold aspects of the function performed by the legal officers of the Department in directing and safeguarding administrative action. The following subjects are illustrative of the submissions acted upon during the year:

Power of the Department to regulate the sale of liquor upon private premises within national parks.

Authority of contracting officers to waive time limitations and other provisions in Government contracts.

Extent of the visitorial power of the Bureau of Mines with respect to privately owned mines.

Necessity for State authorization for Federal appropriation of underground water by means of wells to be developed on the public domain.

Restrictions upon the ownership of mining property by persons employed in the Bureau of Mines.

Limitations upon the investment of land-grant college funds by a State.

Validity of oil and gas leases for scattered tracts in the North Dome Kettleman Hills.

Present right to perfect title to allotment selections made before the passage of the Wheeler-Howard Act.

Extent of Indian title within the Red Lake and San Carlos Reservations.

Three sessions of Congress have now elapsed since the organization of a legislative section in the office of the Solicitor for the better handling of the specialized tasks of drafting bills adequate to meet particular departmental needs and objectives, preparing and reviewing departmental reports and recommendations concerning pending legislation, and representing the Department at congressional hearings upon particular measures. Steadily increasing success in obtaining congressional action in accord with proposals and recommendations of the Department attests to the thorough research, technical expertness, and skill in advocacy which have characterized the performance of these important tasks. Thus, during the second session of the Seventy-fourth Congress, almost every important bill sponsored by this Department, with the exception of the bill to change the name of the Department, was enacted.

Among the bills thus sponsored the following measures are specially noteworthy:

The act of June 26, 1936 (Public, No. 816, 74th Cong.), extending the benefits of the so-called Indian Reorganization Act to the Indians of Oklahoma; and the act of May 1, 1936 (Public, No. 538, 74th Cong.), extending similar benefits to the Alaskan Indians.

The act of June 26, 1936 (Public, No. 827, 74th Cong.), amending the so-called Taylor grazing law to increase the area which may be included in grazing districts from 80,000,000 acres to 142,000,000 acres, thus assuring planned and orderly use of practically the entire area of the public domain which is suitable for grazing rather than for cultivation.

The act of June 23, 1936 (Public, No. 770½, 74th Cong.), providing for a comprehensive Nation-wide study by this Department in conjunction and co-operation with local authorities to the end of developing and coordinating adequate park and recreational facilities throughout the United States.

The act of June 22, 1936 (Public, No. 749, 74th Cong.), providing the Virgin Islands with an organic act characterized by universal suffrage and an increased measure of local participation and control in local government.

A large amount of legal work, both in Washington and in the field, has been required for the accomplishment of Indian tribal organization under the so-called Wheeler-Howard Act. At the end of the fiscal year, 43 separate tribal constitutions had been drafted, accepted by the tribes concerned, and finally approved by the Secretary of the Interior. In 24 other cases substantial progress had been made toward the adoption of constitutions. As a further step in organization, the Wheeler-Howard Act authorizes the incorporation of tribal groups. Only one corporate charter has been issued, although work is in progress on more than 20 such charters.

The exercise of tribal authority with respect to such matters as tribal lands and funds, traders, personnel and taxation necessarily involves much legal detail. Thus, many legal problems have already arisen in the administration of the affairs of reorganized Indian communities. Such problems will continue to arise and to require extensive legal services as is true in the administration of the affairs of ordinary municipalities and similar organized communities.

The preparation of new or greatly revised departmental regulations has been a necessary step in administering much new legislation and in carrying out departmental policies calculated to accomplish the conservation of natural resources through better administration of the public domain and conservation of human values through the better administration of Indian affairs. Thus, the preparation of departmental regulations has been an important work of attorneys in the various bureaus as well as of members of the immediate staff of the Solicitor. The following regulations deserve particular mention:

Amended regulations governing the mineral development of the public domain, including oil and gas, sodium, and phosphate regulations.

Regulations governing timber operations and grazing upon Indian reservations.

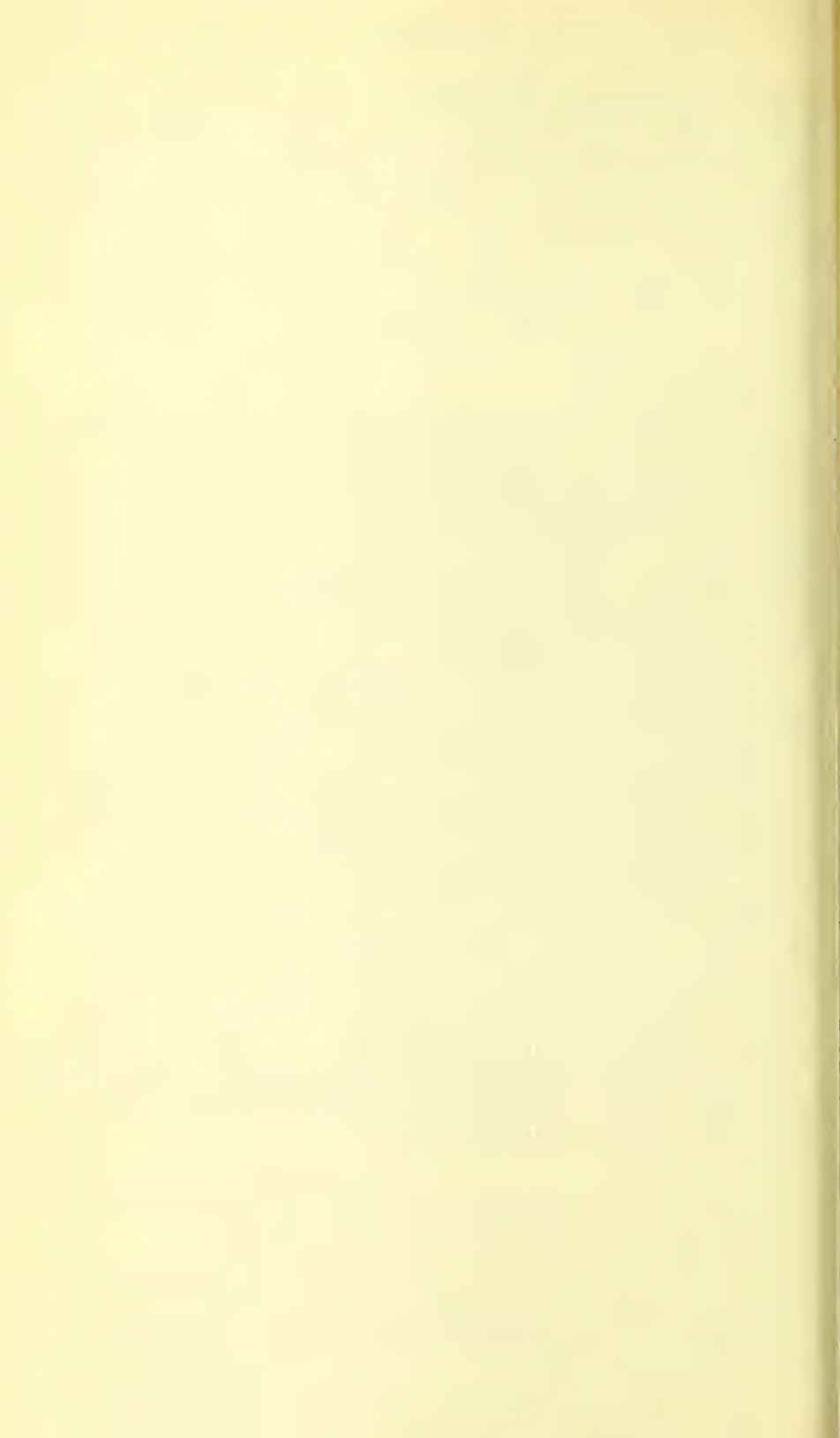
Amended regulations governing the practice of attorneys before the Department.

Regulations governing appeals from the decisions of the Director of Grazing.

The work of the legal sections of the Geological Survey and the General Land Office has increased noticeably as the administration of conservation measures has progressed. Extensive legal services have been required in the consummation of unit plans for the cooperative development of particular oil and gas fields. In the General Land Office the superimposition of conservation laws, including the Taylor grazing law, upon the old and familiar public land laws is creating many new legal problems. The efforts of claimants to establish equities in public lands antedating the present general withdrawals continue to be numerous and ingenious and to require careful legal analysis.

The important business of administering the estates of deceased Indians is being handled by a staff which is numerically inadequate despite improved organization and administrative procedure. The present staff of nine examiners of inheritance in the field and three attorneys in Washington can effectively handle somewhat less than 2,000 estates in 1 year. There are now about 3,000 estates awaiting administration. Such undesirable accumulation of work and the resultant complication in administration can be avoided only by adding to the present probate staff.

Reclamation projects in various stages of development have required extensive legal services in Washington and in the field. For example, the Provo River project, still in its early stages, has required the organization of a new water users association on one division, the negotiation of a large repayment contract upon another division, and the carrying out of the legal detail necessary to bring newly organized metropolitan water districts within the project as stockholders in water users associations. Even old and established projects present their legal problems. Thus, the complex organization of the Owyhee project with its numerous independent contracting entities has been simplified by the devising of a single omnibus contract which has been accepted by the various irrigation districts involved. Again, for some projects the negotiation and drafting of contracts for the sale of power are important tasks. In connection with the Boulder Canyon development the most recent of a series of such contracts has been a contract with the State of Nevada for the use of power generated at Boulder Dam.



DIVISION OF INVESTIGATIONS

LOUIS R. GLAVIS, *Director*

The regular annual appropriation for the Division of Investigations for the purpose of conducting investigations for the Department of the Interior for the fiscal year 1936 was \$391,700.

The average number of active field investigators, exclusive of special agents in charge, was 65; average number of clerks employed in divisional offices, 18; total average force employed, including special agents in charge, and the Washington office force, 88.

Due to the activities of field investigators, \$19,063.67 was collected and turned into the Treasury, and 424,564.02 acres restored to the public domain, representing fraudulent entries, etc., canceled on proceedings based on their reports.

INVESTIGATIONS

On July 1, 1935, there were pending field investigation 8,167 cases. During the year 12,345 new cases were received; 13,217 cases were investigated, reported, and closed, leaving 7,295 cases pending investigation. Four cases were turned over to the Post Office Department as the result of investigations made in the field; and five criminal cases were presented to the Department of Justice during the year; four convictions were secured in criminal cases and one indictment returned during the fiscal year.

FEDERAL EMERGENCY ADMINISTRATION OF PUBLIC WORKS

The Division of Investigations conducts all investigations for the Public Works Administration. The staff personnel on June 30, 1936, including the central office at Washington, consisted of 10 special agents in charge, 220 special agents, and 152 other employees.

Cases investigated by the Division of Investigations relate to expenditure of Public Works Administration funds, collusion and fraudulent bidding where contractors and subcontractors are involved, wages and disputes arising from rates of pay, irregularities in the employment of labor and use of materials, underpayment of employees, repayment to contractors of wages of employees, contracts relating to housing projects, governmental personnel, and mis-

conduct of officers and employees of the Public Works Administration, activities of the National Reemployment Service and other governmental agencies, to which Public Works Administration funds are allotted.

These investigations, having to do with the allotment and expenditure of large sums of money, enabled the administrative officers to uncover numerous frauds and irregularities and prevent substantial losses to the Government.

Saving was accomplished by and through investigations covering such items as cancelation or rescission of contract bids and awards where fraud or collusion was found to exist, rescission of allotments for loans and/or grants due to irregularities or fraudulent representation; lack of economic soundness in projects investigated, inadequate financial ability of the borrower or his inability to liquidate loans, and the use of insufficient or inferior material in construction work.

There also were included penalties imposed on contracts for violation of the 8-hour law on Federal projects, reduction in allotments where it was found that the borrower had included excessive amounts in estimates covering overhead and engineering fees, reduction of allotments due to fictitious estimates and excessive appraisals covering the purchase of lands for projects, sites, and savings effected by requiring a change in the method of construction from force account to a contract basis.

The Division of Investigations also effected other savings. One of the more important of these was reimbursement of wages to labor where such pay was wrongfully withheld by contractors through what has been designated as the "kick-back racket." It is estimated that this saving to labor by such reimbursements amounted to \$182,137.83 for the fiscal year.

Nineteen thousand seven hundred and twenty-six cases were investigated and reported by special agents of the Division of Investigations. Included in the foregoing were 60 criminal prosecutions, of which 18 cases received court action, 39 cases resulted in indictments, and 1 case received a prison sentence.

OIL ENFORCEMENT

The Director of Investigations performed all investigations, under the supervision of the Secretary of the Interior in the enforcement of the provisions of the act of Congress of February 22, 1935 (Public, No. 14), generally known as the Connally Act.

During the first 6 months of the fiscal year, the Division of Investigations (oil enforcement) maintained eight offices, which on January 1, 1936, were reduced to four, namely, Kilgore and Houston, Tex., Chicago, Ill., and Washington, D. C.

Federal Petroleum Agency No. 1, with headquarters at Kilgore, Tex., was created by Executive Order No. 7024-B dated April 25, 1935, under authority of the Connally Act. The Secretary of the Interior designated this agency to exercise all duties and functions pertaining to investigations necessary to the enforcement of the Connally Act.

The marine unit with headquarters at Houston, Tex., was engaged in the enforcement of the Connally Act insofar as the movement of petroleum and its products into interstate or foreign commerce by water-borne vessels was concerned.

The Chicago office conducted investigations on shipments of petroleum and its products from producing areas.

The Washington office was comprised of an administrative force and a branch of the marine unit which compiled statistics on the movement of petroleum and its products by tankers and barges.

The personnel of the Division of Investigations engaged in the enforcement of the Connally Act as of July 1, 1935, numbered 82. The personnel absorbed by the Petroleum Conservation Division as of May 1, 1936, as a result of the Secretary's order no. 1054, dated March 14, 1936, and no. 1067, dated May 1, 1936, numbered 34.

The total obligations incurred by the Division of Investigations (oil enforcement) amounted to \$147,751.

The total number of cases investigated was 1,255, of which 8 Criminal Code cases and 99 cases of violations of the Connally Act were referred to the Department of Justice.



BOARD ON GEOGRAPHICAL NAMES

GEORGE C. MARTIN, *Executive Secretary*

The work of the Board on Geographical Names is essentially a service which the Department of the Interior renders to other governmental organizations and to the public. The principal function of the Board is to insure uniformity in the use of geographic names on maps and in publications issued by the Federal Government. As the official authority on the use of geographic names by the Government, the Board decides unsettled questions as to the form, spelling, or application of geographic names, and considers new names proposed by Government officers. Its decisions, according to Executive Order No. 399, are "to be accepted by the departments of the Government as the standard authority."

The Board also serves as an informally recognized standard authority in the nongovernmental use of geographic names. In this capacity it renders decisions on geographic names at the request of local authorities, institutions, publishers, and individuals. The Board is also called upon, by Government, State, and local officials, educational institutions, scientific societies, publishers, teachers, and others, to furnish information on many geographic subjects other than names.

The broad geographic scope of the Board's activities, and the extent to which it serves other organizations, are shown by the following tabulation of cases that have been before it for formal action during the year, grouped by the location of the features and by the organizations that submitted the names.

Geographic distribution of names

Alaska.....	342	Washington.....	8	South Dakota.....	2
California.....	103	Michigan.....	6	Nevada.....	2
New York.....	63	Arizona.....	6	Oregon.....	2
Wyoming.....	56	Illinois.....	5	Dominican Republic..	2
Louisiana.....	49	Missouri.....	5	Mexico.....	2
Utah.....	43	Colorado.....	4	Russia.....	2
Oklahoma.....	36	New Jersey.....	4	China.....	1
Texas.....	35	New Mexico.....	4	Dutch East Indies...	1
New Hampshire...	33	North Carolina.....	4	Peru.....	1
Alabama.....	28	Connecticut.....	3	Idaho.....	1
South Carolina...	21	Florida.....	3	Iowa.....	1
Minnesota.....	21	Hawaii.....	3	Mississippi.....	1
Maryland.....	19	Nebraska.....	3	West Virginia.....	1
Virginia.....	12	Tennessee.....	3	Virgin Islands.....	1
Massachusetts...	11	Wisconsin.....	3		
Maine.....	11	North Dakota.....	2	Total.....	980
Georgia.....	9	Ohio.....	2		

Organizations requesting decisions

U. S. Coast and Geodetic Survey--	253	Library of Congress-----	3
U. S. Hydrographic Office-----	187	Soil Conservation Service-----	2
U. S. Geological Survey-----	156	Bureau of the Census-----	1
National Park Service-----	133	Bureau of Foreign and Domestic	
Societies and individuals-----	91	Commerce-----	1
U. S. Forest Service-----	77	Post Office Department-----	1
Bureau of Chemistry and Soils----	31	Secretary of the Interior-----	1
U. S. Board on Geographical		The White House-----	1
Names-----	22		
State organizations-----	16	Total-----	980
Bureau of Biological Survey-----	4		

Although the work of the Board is administratively under the direction of the Secretary of the Interior, in whose name, and with whose approval, the decisions of the Board are promulgated, its investigations are made with the cooperation of, and its decisions are rendered by, an advisory committee of 14 members, consisting of representatives of various departments that make and use maps, and of geographic societies. This advisory committee operates chiefly through its executive committee of three members. The routine administrative and investigative work of the Board is performed by a small organization in the office of the Secretary of the Interior. These two units have been operating since December 10, 1935, under a single name, in accordance with a departmental order.

The advisory committee held three meetings during the year, at which interim action of the executive committee was considered and approved, and questions of general policy and procedure were discussed.

The executive committee held 14 meetings during the year, at which 472 geographic names were approved. In addition to the names that were automatically rejected by the approval of the above, six other proposed new names were rejected as unsuitable. The committee had before it, at the end of the year, eight names which had been considered without final action.

The work of the Board has increased far beyond that of the preceding year, when 267 names were approved. Decisions were rendered during the year ending June 30, 1936, on 478 names, and 502 cases were on hand June 30, in various stages of completion.

A pamphlet entitled "Decisions Rendered Between July 1, 1934, and June 30, 1935", was issued in February 1936. Manuscript of a pamphlet entitled "Decisions Rendered Between July 1, 1935, and June 30, 1936", has been submitted for publication.

DIVISION OF GRAZING

F. R. CARPENTER, *Director*

The purpose of the act of June 28, 1934 (48 Stat. 1269), known as the Taylor Grazing Act, is to "stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes."

This act is a new development in the national policy for the conservation of natural resources, and few laws entrusted to the Federal Government so vitally affect the livelihood of so many people. Both from the standpoint of national conservation and of the livestock industry, it is of transcendent importance. This act has the approval of the country as a whole, and the administration of it has been received generally with enthusiasm by those affected in the public-land States of the West. Through the aid of hundreds of these people, rules and regulations governing grazing have been prepared, ways of conserving the forage resources of our public lands worked out, and methods of administration devised to provide equitable rights to all. The current report deals with the activities of the second year of administration of the act.

During the first year, the Department was engaged principally in preliminary steps necessary for the carrying out of the terms and provisions of the law, the establishment of an organization, the devising of rules and regulations, the working out of plans for cooperation, and numerous other duties and activities for the administration of 80 million acres of public grazing lands.

The second year has been devoted to enlarging the area brought under control, improving the rules and regulations as a result of the experience gained, perfecting the details of organization, and the institution of administrative control over areas through cooperative agreements with local interests as provided in section 2 of the act. Range survey studies and the measuring of private holdings to determine the commensurate ratings of various applicants for grazing privileges have been initiated in all of the States involved, and in the States of New Mexico and Arizona material of great assistance to administrative officers is now available.

The matter of wildlife protection has been given every possible consideration. Agreements have been reached with the Bureau of Biological Survey for the establishment of game ranges under the joint jurisdiction of the Departments of the Interior and Agriculture. The Division has adopted what is known as the New Mexico plan which provides for representation by the wildlife interests of the State upon the advisory boards whose functions are to assist in the administration of all grazing areas. Similar proposals have been made to the game interests of other States, and progress is being made toward a satisfactory solution of this important problem.

One essential element of the administration of the Division of Grazing is the advisory boards, consisting of 523 representative and able stockmen elected by the licensees of the various districts. Through their knowledge of local conditions and usage, the Division has access to information and advice concerning every point and section of the country under jurisdiction of the act. These boards function in an advisory capacity and their value to the administration of the act cannot be overestimated. A tribute should be paid to the loyalty and untiring efforts which members have applied to solving the problems before them. This system of home rule under Federal administration and supervision, instituted as one of the main objects and integral parts of the Taylor Grazing Act's administration by the Department, has been highly successful and satisfactory to the stockmen.

On January 13 and 14 a meeting was held in Salt Lake City, attended by four delegates from each of the district advisory boards, totaling 800 persons, and including representatives of the Department, the Division of Grazing, the General Land Office, and other Federal, State, and livestock organizations interested in the grazing work. The meeting, which was called by the Secretary, was in the nature of a get-together to discuss the problems of grazing, to find possible weaknesses, and to make plans for betterment of the administration, as well as to discuss future policies. Information obtained at this meeting was used as a basis for formulating the 1936 rules and regulations covering the issuance of grazing licenses.

The end of the fiscal year 1936 finds 37 grazing districts under administration, including substantially 80,000,000 acres of public grazing lands. During the year, more than 15,000 licenses were issued for the grazing of livestock, involving a total of more than 8,000,000 animals.

On June 26, 1936, an amendment to the original Taylor Grazing Act was passed. This amendment provides, among other changes, an added allotment of 62,000,000 acres, making a total of 142,000,000 acres available for inclusion in grazing districts. This will permit

the placing in grazing districts of practically all of the public domain grazing lands which are of such character as may be administered suitably in grazing districts.

To make available information concerning the activities of the Division, the Secretary of the Interior has authorized a quarterly publication, the *Grazing Bulletin*. The first two issues of the bulletin were published in March and in June.

ORGANIZATION

The organization of the Division of Grazing has been developed on the principle of decentralizing administration as far as consistent. Following this principle, an administrative office has been established in Washington, a regional field headquarters office in Salt Lake City, Utah, and nine regional offices located at Salt Lake City, Utah; Reno, Nev.; Burns, Oreg.; Boise, Idaho; Billings, Mont.; Grand Junction, Colo.; Albuquerque, N. Mex. and Phoenix, Ariz.

This provides ready access to responsible administrative officers of the Division by the persons affected by the act, brings about a better understanding of the problems involved, and speeds administrative action. Each regional office is in charge of a regional grazier who is assisted by one or more graziers and office personnel. At the close of the year, the Division had in its employ a total of 60 permanent employees, 13 of which were attached to the Washington office and 47 to the various field offices. This involves an increase of 25 employees during the year, including 13 graziers, 4 junior range examiners, and 8 clerical employees of various grades. All new personnel in the grazier and range examiner class are western men from one of the States in which the grazing act is operative, and so far as possible, men have been employed and assigned to work in the State in which they reside.

ADMINISTRATION OF GRAZING DISTRICTS

The administration of grazing districts involves application and enforcement of rules and regulations pertaining to the use of the range, and the establishment and fixing of boundaries of such districts. It also includes issuance of licenses, term permits, and range allotments; the handling of appeals and protests arising from action taken upon applications for grazing privileges; maintenance of range improvements; application of range management plans; and wildlife protection.

Subsequent to the rules and regulations issued during the first year of the act, Division of Grazing Circular No. 3 providing for the appointment of one district advisor in each grazing district in the

State of New Mexico to represent wildlife and recreational resources was approved August 21.

Circular No. 4, entitled "Rules and Regulations Governing Appeals from Decisions of the Director of Grazing", was approved October 7, 1935.

Circular No. 6, entitled "Procedure for Enforcement of Penalties for Violation of the Act of June 28, 1934, and Rules and Regulations Issued Thereunder", was approved December 9, 1935.

Following the general meeting of departmental officials and stock interests in Salt Lake City on January 13, 1936, when certain changes in the rules and regulations were recommended, a revised set of general rules for administration of grazing districts was prepared and approved March 2, which superseded previous Circulars Nos. 1, 2, 4, and 6. These regulations provided for the first time the payment of a fee for grazing privileges, which is established at 5 cents per month for each head of cattle or horses and 1 cent per month for each head of sheep or goats. By order approved May 15, the rate to be charged was clarified to the effect that where a grazing period involves a fraction of a month, the grazing fee for such fraction shall be charged on a daily basis, prorated on a 30-day month.

GRAZING DISTRICTS

As of June 30, 1935, there were 32 established grazing districts under the Taylor Act. During the year just ended, 5 more districts were established on the recommendation of State committees, making a total of 37 districts. These districts include a gross area of 198,338,000 acres, of which 79,805,186 acres are vacant, unreserved, unappropriated public lands.

Fifteen thousand eighty-one temporary licenses were issued during the year for 8,396,351 head of livestock, a detailed summary of which is shown in the attached table. These licenses were issued on a temporary basis, pending the completion of land classification studies and a determination of the commensurate ratings of properties dependent on the public ranges and are revokable for violation of the terms thereof.

Applicants for licenses were originally classified in the following preferential order:

1. Qualified applicants with dependent commensurate property with prior use.
2. Qualified applicants who have prior use but not adequate commensurate property.
3. Qualified applicants with dependent commensurate property but without prior use.

In accordance with recommendations of the Salt Lake City meeting, a change in the order of preferred applicants was effected by the rules of March 2, which specify the following preferential classes:

1. Qualified applicants with dependent commensurate property with priority of use.
2. Qualified applicants with dependent commensurate property but without priority of use.
3. Qualified applicants who have priority of use but not commensurate property.
4. Other qualified applicants.

Grazing licenses issued by Division of Grazing, Department of the Interior, for 1935

State	Cattle	Horses	Sheep	Goats	Total	Licenses
Arizona.....	31, 156	1, 933	184, 438	21, 190	238, 717	385
California.....	85, 146	4, 135	222, 328	-----	311, 609	576
Colorado.....	231, 080	682	719, 177	164	951, 103	2, 155
Idaho.....	90, 904	11, 479	709, 702	3	812, 088	882
Montana.....	40, 924	17, 387	174, 841	14	233, 166	489
Nevada.....	247, 012	24, 411	733, 903	212	1, 005, 538	689
New Mexico.....	372, 994	19, 417	532, 714	119, 434	1, 044, 559	1, 702
Oregon.....	197, 676	25, 036	420, 991	18	643, 721	1, 173
Utah.....	238, 011	22, 186	2, 383, 837	31, 446	2, 675, 480	6, 501
Wyoming.....	42, 073	4, 393	319, 604	-----	366, 070	529
Total licenses.....	-----	-----	-----	-----	-----	15, 081
Total livestock.....	-----	-----	-----	-----	-----	8, 396, 351
Total cattle.....	-----	-----	-----	-----	-----	1, 576, 976
Total horses.....	-----	-----	-----	-----	-----	131, 059
Total sheep.....	-----	-----	-----	-----	-----	6, 515, 835
Total goats.....	-----	-----	-----	-----	-----	172, 481

52 percent of all cattle licensees were owners of less than 50 head of stock.

38.5 percent of all sheep licensees were owners of less than 500 head of stock.

93.1 percent of all cattle licensees were owners of less than 500 head of stock.

86.3 percent of all sheep licensees were owners of less than 3,000 head of stock.

A number of users of the public lands cannot meet the requirements set forth in the regulations for a grazing license, and the problems arising from this condition have been among the most difficult to solve in the administration of the act to date. The Division is fully cognizant of the hardship which may result from immediate ejection of these persons from the range, and in all cases adequate time was granted in which to make other provisions for the handling of their livestock.

The termination of free and unrestricted grazing which has prevailed for so long has naturally resulted in some violation of the rules and regulations providing for the administration of the public ranges. However, these violations have been remarkably few. A large number of alleged trespasses have been investigated, trespass notices served, and trespasses abated. Many cases have also been investigated for violation of the terms of the licenses. Approximately 100 motions for review of the decisions of the regional graziers have

been filed and are now pending local hearing. Many of these are expected to be adjusted without the necessity of a hearing.

Court proceedings have been found necessary in a number of cases of continued trespass in which parties have failed to remove their stock after due notice. An outstanding case involving violation of the rules and regulations during the year was that of the *U. S. v. Joe Odiago and Cleto Achabal*, in which the defendants challenged the constitutionality of the Taylor Act. In a decision rendered June 22, Federal Judge John H. McNary of the United States District Court for Oregon overruled demurrers filed in behalf of the defendants with the following opinion:

It is settled by the highest judicial authority that, "All public lands of the Nation are held in trust for the benefit of the whole country" and that the Constitution vests in the Congress all the rights incident to the private ownership of such lands.

The provision of the act authorizing the Secretary of the Interior to establish grazing districts and make such rules and regulations as shall be necessary to accomplish the purposes of the law, does not constitute a delegation of legislative power but creates administrative duties. Obviously the fixing of boundaries of grazing districts so as to prevent overgrazing and soil deterioration is a matter of detail, and a necessary subject of inquiry and determination by an administrative officer.

The Secretary of the Interior is authorized by the act to make rules regulating permits and preferences not inconsistent with the provisions of section 3 of the act.

The defendants were held for trial before the United States District Court for Oregon which is expected to be held during the October session of 1936.

COOPERATIVE AGREEMENTS

Section 2 of the Taylor Grazing Act provides that—

the Secretary of the Interior * * * shall make such rules and regulations and establish such service, enter into such cooperative agreements, and do any and all things necessary to accomplish the purposes of this act and to insure the objects of such grazing districts, namely; to regulate their occupancy and use * * *.

Under the authority granted in the section above quoted, the Secretary on March 17, 1936, approved a form to be followed in entering into cooperative agreements with local associations of stockmen. This particular form of agreement was drawn to provide for grazing administration in Montana, where the public lands in grazing districts constitute only about 25 percent of the area and are intermingled with State, county, tax default, railroad, and other privately owned lands. It is, however, adaptable for use in any State where a similar situation may exist.

Licenses are issued to those entitled to them by the board of directors of the association under the general supervision of the Division of Grazing.

This method is meeting with approval, and agreements have been entered into with nine associations in Montana. A number of local associations in other States are in the process of organization, and it is expected that in the near future numerous agreements will be submitted to the Secretary for approval.

IMPROVEMENTS

The Taylor Act provides for the construction, purchase, and maintenance of range improvements within grazing districts, and that 25 percent of all collected fees when appropriated by Congress are returnable for this purpose. No money was available from this source during the past year, but a diversified range improvement program has been carried on through the C. C. C. camps. Stock-water development, construction of trails and fences, rodent and insect control, and soil erosion activities are under way, and the accomplishments are described more fully later in this report. The Division has also acquired approximately 100 wells distributed over grazing districts in the State of Utah from the Utah Drought Relief Commission. These wells afford increased utilization of available resources in areas where permanent water was formerly lacking, and are a distinct asset to the grazing ranges of this State. The wells are operated by the Division through the temporary employment of local help.

STOCK DRIVEWAYS

Administration of established stock driveways within grazing districts was placed under the jurisdiction of the Division of Grazing April 20. These driveways are reserved under the provisions of the act of December 29, 1916 (39 Stat. 865 U. S. C., title 43, sec. 300). It is the purpose of the Division to effect at the earliest possible date a practical system of driveways within districts which will involve revision of many of the existing withdrawals.

WILDLIFE PROTECTION

In cooperation with the Bureau of Biological Survey, the Division has begun a program of wildlife conservation through the establishment of game ranges to be managed cooperatively by both agencies. Ten areas containing an approximate total of 10,000,000 acres have been agreed upon, and Executive orders have been issued establishing the following:

Desert game range, Nevada-----	May 20, 1936.
Hart Mountain game range, Oregon-----	Sept. 6, 1935.
Charles Sheldon refuge, Nevada-----	May 6, 1936.

The preparation of orders establishing other ranges is almost complete and their establishment should be consummated within a short time. Under the terms of these orders, the right to forage resources of the lands will be reserved for a definite number of wildlife, with the remaining forage to be utilized by domestic animals. The Division has also fully cooperated with the Bureau of Biological Survey in the establishment of refuges for waterfowl and game, which will be administered entirely by the Bureau of Biological Survey.

The Secretary of the Interior on August 21, 1935, approved Division of Grazing Circular No. 3 entitled "Special Rules for Grazing Districts in New Mexico", which embodies the so-called New Mexico plan. In substance, it provides that in addition to the regularly elected district advisors for each grazing district established under the Taylor Grazing Act in New Mexico, there be appointed one district advisor in each grazing district to represent wildlife and recreational resources. Such district advisor shall have the same qualifications as the elected advisors, except that he need not be an owner of livestock, and he shall be nominated by the land-use committee of the New Mexico State planning board. This board advisor will be appointed by the Secretary of the Interior in the same manner and form as the other district advisors.

The plan provides that the utilization of grazing district lands by domestic livestock shall be in accord with the following fundamental principles for conservation and propagation of wildlife and other natural resources upon the public domain. In allotting range resources, allowance will be made for a reasonable utilization by wildlife. Game and bird refuges may be established within grazing districts. In areas determined by the Secretary of the Interior, upon consideration of all interests involved, to be of higher value for and better adapted to production of wildlife than to domestic stock, preference shall be given to such higher use. Should game animals become overabundant, the State or Federal laws will be invoked to limit by removal, through hunting or otherwise, game animals until a reasonable number has been attained. All permittees on grazing districts shall comply with State and Federal game laws, and officials of the Department of the Interior will cooperate in enforcement of these laws. This plan has met with the approval of the varied interests of New Mexico, and the game interests of other Western States are now being consulted to work out similar arrangements. From an individual standpoint, the ranchers and livestock men are themselves the greatest conservators of the wildlife in the West.

Many of the large ranches are literally game reserves and bird refuges, where grouse, sage hens, pheasants, deer, and antelope abound and are afforded such protection as the owners of the ranches on which they roam are able to give them.

CLASSIFICATION OF LANDS

The work of the Division with respect to the classification of lands embraces chiefly the range-survey program by which fundamental basic data is secured to build range-management plans. These surveys embrace both reconnaissance and detailed studies pertaining to the character of range lands with respect to their present condition and carrying capacity, proper seasons of use, classes of livestock to which adapted, needed range improvements, and other pertinent data which must be secured in making plans both for current use and ultimate rehabilitation of the forage resources.

It further includes the preparation of status maps showing the ownership of all lands within grazing districts and a measure of the basic ranch properties of applicants which must serve as a basis for ascertaining the commensurate rights of each individual to grazing on the public lands.

A considerable amount of data of this kind was previously obtained by the Geological Survey, and this information is now available to the Division of Grazing. All phases of this work are now under way in all the grazing districts under administration, and it is being pushed as rapidly as possible with the available means. During the year, the Division has acquired and compiled considerable additional information through the cooperative efforts of the various State agricultural colleges, the Division of Investigations of the Department of the Interior, and other Federal agencies.

The end of the fiscal year finds the preparation of status maps approximately 60 percent completed; the analysis of basic range properties, approximately 25 percent completed; and necessary field work on range studies, approximately 10 percent completed.

The Division is also charged with the classification of lands with respect to their value for agricultural purposes as required by the various land laws. These classifications involve recommendations for designations under the enlarged and stock-raising homestead acts, a determination of the value of watering places for public purposes, classification of lands applied for under section 7 of the Taylor Grazing Act, and determination of the propriety of approving applications under sections 8, 14, and 15 from the standpoint of the public benefit where lands involved in these applications fall within boundaries of grazing districts.

Recommendations for designations of lands under the enlarged and stock-raising homestead acts have been substantially terminated by the Executive orders of November 26, 1934, and February 5, 1935, withdrawing public lands for classification. During the year, 1,711 cases under these acts were acted upon, embracing principally those filed prior to the Executive withdrawals, and on June 30, only 110 such cases were still pending action by the Division. During the year, 1,120 acres were designated under the enlarged homestead act in 6 States, increasing the total acreage so designated at 268,468,865 acres; 7,295 acres of land were designated under the stock-raising homestead act in 11 States, increasing the outstanding area to 102,436,542 acres.

One thousand one hundred fifty cases have been received for action by the Division under sections 7, 8, 14, and 15 of the Taylor Grazing Act, and a total of 72 applications under these sections have been acted upon.

During the fiscal year, 2,240 acres in 8 States were included in public water reserves, and 80 acres in 1 State were excluded from such reserves, resulting in a net increase of the gross public water reserve areas in 12 States to 510,388.

Action on pending applications under sections 14 and 15, which involve lands in present and proposed grazing districts, has necessarily been delayed pending a study of the areas involved to determine the practicability of administration of the land as a part of the district. Field offices are now engaged in preparing reports on the advisability of eliminating certain areas including scattered tracts of public land from districts in order that they may be disposed of under these sections of the act.

EMERGENCY CONSERVATION WORK

On July 1, 1935, 7 C. C. C. camps engaged in range improvement work were being operated by the Division, and plans were formulated for receiving 53 additional camps under the expanded program of Emergency Conservation Work. However, a revision in the general program and a reduction in the total number of C. C. C. companies reduced the quota of camps allotted to the Division to 45—an increase of 38.

Each State, with the exception of Montana, was allotted a number of camps, and the entire public-domain area was divided into three regions for efficient administration and supervision of work projects. Region 1 comprises the States of Colorado, Utah, Wyoming, and Idaho, with regional headquarters at Salt Lake City, Utah. Region 2 comprises the States of Oregon, Nevada, and California, with regional headquarters at Reno, Nev. Region 3 comprises the States

of New Mexico and Arizona, with headquarters at Albuquerque, N. Mex.

Construction of camps was delayed, and the entire quota was not officially turned over for occupancy and operation until the middle of October, so that the actual increase in work accomplished and completed over that done by the seven camps during the fifth enrollment period, April 1, 1935, to September 30, 1935, was not appreciable.

The rigors of winter prevented a full-time schedule for the sixth enrollment period, October 1, 1935, to March 31, 1936, but satisfactory progress was made and the various livestock organizations, district advisory boards, stockmen, and interested citizens have expressed their satisfaction and appreciation for the improvements made in the range areas.

On April 1, 1936, the E. C. W. branch of the Division was fully organized and functioning efficiently, and work programs recommended and approved by the advisory boards of the grazing districts were ready for execution by the C. C. C. companies under the technical supervision of the Division and the appointed supervisory personnel.

The public domain range lands are generally located in areas of low precipitation, with a maximum of 15 inches per year. Accordingly, the work projects, outlined and approved by the stockmen and the advisory boards, directed toward water development and means for the movement of stock, have been given preference. Water-development projects have contributed considerably to an actual increase in water resources and have been a means of better utilizing the forage resources of the range. By judiciously placing these water developments difficulties sustained in former years through a lack of water will be eliminated and will accomplish a great deal toward placing the livestock operator on a more substantial plane of operation. Four hundred twenty thousand man-days were expended on water-development projects, including wells, flood eradication, construction of reservoir and other storage facilities during the year.

The construction of fences to control the movement and grazing of livestock, construction of stock trails, truck trails, and minor roads to facilitate movement through grazing districts, and the construction of corrals form other major parts of this construction program. Rodents definitely destroy incalculable amounts of forage annually, and the control of these pests has been undertaken with the cooperation of the Bureau of Biological Survey in infested areas. The program also includes campaigns against the destructive mormon crickets, the eradication of noxious and poisonous plants, and erosion-control measures.

The following is a summary of the most important accomplishments of the year:

Water holes and small stock reservoirs (completed) (capacity 30,000,000 gallons)-----	152
Wells-----	26
Pipe lines (for stock water)-----feet--	27, 000
Truck trails-----miles--	1, 336
Minor roads-----do--	321
Stock trails-----do--	135
Bridges-----	27
Fences-----miles--	260
Corrals-----	68
Cattle guards-----	58
Rodent control-----acres--	2, 600, 000
Noxious and poisonous weed eradication-----do--	80, 000
Insect-pest control-----do--	48, 000

In addition a large volume of work has been completed on erosion-control structures involving the construction of more than 30,000 check dams, diversion ditches, terracing, channel excavations, and stream-bank protection.

FIRE AND FLOODS

Emergency work has been done by the enrollees in time of fire and flood. During floods in New Mexico which almost destroyed the city of Las Cruces and cost millions of dollars in damage to the surrounding valleys, the C. C. C. workers were highly praised by local officials for the heroic part they played during the disaster. Besides giving assistance in the flood-stricken districts, a dike was built near the town of Hatch which saved the town from destruction.

Enrollees have given valuable aid in fighting fires, and approximately 8,600 man-days of labor were consumed for this purpose. Through cooperative agreements with other Federal and State agencies, use of C. C. C. enrollees of any camp is made immediately available for any fire emergency.

EDUCATIONAL PROGRAM

The educational program is an important part of each C. C. C. camp, and it has been planned to fit the requirements of the individual enrollee. The chief objectives of the program are vocational, character, and citizenship development, with specific consideration given to job training. Every opportunity is given the enrollees to master the machinery used on the work projects, and through the daily work in connection with classroom instruction many skilled workers have been developed from completely untrained men. Systematic instruction on the job includes practice on the job in the

field and at least 2 hours per week of systematic basic instruction underlying the work off the job. This basic instruction includes a general course in conservation.

The Emergency Conservation Work organization of the Division has grown from a total of 133 persons on July 1, 1935, to 585 persons on July 1, 1936. The personnel has been employed with particular attention to the supervision necessary for the specialized work projects and the administration incident to Emergency Conservation Work.

A survey of the range areas and a full realization of the imminent need for stabilizing the stock industry by improvement means, indicate that in order to supply properly and adequately the needs of 142,000,000 acres of range lands, now or to be included in 50 grazing districts, requires at a minimum 200 200-man C. C. C. camps for a minimum period of 10 years. By judiciously locating the camps and with smaller units working from the base camp in each grazing district according to seasonal conditions and construction or type of camp, it is believed the entire area can be easily and efficiently served. The quota of 45 camps now allocated to the Division permits only a very small portion of the public domain to receive range improvements. The participation of the Division of Grazing in Emergency Conservation Work should be decidedly increased and the activities expanded.



DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

ERNEST GRUENING, *Director*

The Division of Territories and Island Possessions was created by Executive Order No. 6726, issued by the President on May 29, 1934. This order provided for the transfer of all functions pertaining to Puerto Rico, previously vested in the Bureau of Insular Affairs, War Department, to the new Division to be administered under the supervision of the Secretary of the Interior. In accordance with the intention of the order to centralize and coordinate territorial affairs, the activities pertaining to Alaska, Hawaii, and the Virgin Islands, already under the jurisdiction of the Department of the Interior, were transferred to the new Division. These activities included not only general supervision of the respective governors' offices, but also the Alaska Railroad, the Alaska Road Commission, Alaska reindeer, Alaska insane, the Virgin Islands Co., the Government-owned Bluebeard Castle Hotel at St. Thomas, Virgin Islands, Puerto Rico Hurricane Relief Loan Section; and the Hawaiian Homes Commission.

The supervisory relationship of the Division of Territories and Island Possessions to the activities under its jurisdiction was cemented during the year by inspection trips of its officials to Alaska, Hawaii, Puerto Rico, and the Virgin Islands; also the governors and other officials of the respective Territories and possessions visited Washington for the purpose of presenting problems and securing the assistance of the Division in their solution. This interchange of visits and conferences has brought about a feeling of mutual understanding and cooperation which provides a firm foundation for effective administration in the future.

Through the Puerto Rico Reconstruction Administration, the Virgin Islands Co., the Alaska Rural Rehabilitation Corporation, and the Hawaiian Homes Commission, long-range policies for the improvement and economic social welfare of the Territories and possessions are being effectively carried out under the supervision of the Division. A general outline of these activities is set forth later in this report.

During the year, Baker, Howland, and Jarvis Islands were, by Presidential order, placed under the jurisdiction of the Division and

Congress made an appropriation for their colonization. These equatorial islands are situated in the Pacific Ocean south of Hawaii and headquarters for their direct administration have been set up by the Division in Honolulu. The first expedition under the supervision of the Division was organized with the cooperation of several other Government departments in June, and four colonists, with food, supplies, water, etc., were placed on each of the three islands to make weather observations and compile scientific data for use in connection with possible future air routes to the South Seas, New Zealand, and Australia.

VIRGIN ISLANDS

The Division has been active in supervising the administration of the government of the Virgin Islands and in carrying out the program for economic and social rehabilitation. Under date of August 21, 1935, the President issued an Executive order placing the administration of relief, work relief, and useful projects for the islands under the jurisdiction of the Governor of the Virgin Islands, subject to the supervision of the Secretary of the Interior. This order has had the effect of coordinating all Federal relief activities in the Virgin Islands.

The United States Government purchased 5,000 acres of land together with 2 sugar mills, a distillery, warehouses, 10 villages, machine shops, garages, wharves, livestock pens, and miscellaneous agricultural buildings. A P. W. A. allotment of \$2,000,000 was made available to acquire these properties, to recondition them with new machinery, to construct new villages and to purchase tractors, trucks, work animals, and, in general, to create a reconditioned agricultural and industrial plant.

The Virgin Islands Co. is the corporation organized to manage and operate these properties. The company has raised 4,000 crates of tomatoes and shipped them to the New York market. The company has planted and cultivated 1,500 acres of sugarcane. Each year the company purchases \$45,000 worth of sugarcane grown by 700 small growers. Last spring the company sold 25,000,000 pounds of sugarcane to the privately owned LaGrange Sugar Factory and rum distilleries on the island of St. Croix. Tractors and farm equipment are rented to all persons and corporations applying. All of the sugarcane purchased by the company and part of the cane raised by the company has been processed into 500,000 gallons of straight cane juice rum, which has been placed in charred oak barrels to be aged.

The Congress of the United States has enacted legislation authorizing the Virgin Islands Co. to pay taxes into the treasury of the

islands. This income is to assist the local legislatures to provide funds for school, hospitals, island public works, and police and fire protection.

The Virgin Islands Co. program has been established to create commerce, furnish employment to approximately 1,000 persons, improve living conditions and gradually to relieve the Congress of the United States from making annual appropriations for the support of the islands' schools, hospitals, and other municipal expenses.

PUERTO RICO

As referred to in the report of last year, a comprehensive reconstruction program has been put into effect covering rural rehabilitation, rural electrification, slum clearance and housing, reforestation, and construction of buildings for the University of Puerto Rico.

Legislation was obtained from the Seventy-fourth Congress by which, beginning with the fiscal year to end June 30, 1938, Puerto Rico is entitled to share in appropriations which may become available for apportionment under the Federal Aid Road Act of July 11, 1916, under the same terms and conditions as any of the several States. Under another act, approved August 23, 1935, bank deposits in Puerto Rico may be insured, thus affording the same protection to depositors there as now given to depositors in the United States under the Federal deposit insurance laws. Also pursuant to recommendation of the Governor, we obtained extension of the Liquor Enforcement Act of 1936 to Puerto Rico.

Loans made by the former Puerto Rican Hurricane Relief Commission are now in process of composition and adjustment as authorized in Public Resolution No. 60, Seventy-fourth Congress, approved August 27, 1935. Regulations governing the procedure to be followed in making the compositions and adjustments were approved August 26, 1936. Two loans were paid off during the year. There are now 3,613 loans outstanding, which were originally contracted in the amount of \$5,655,760. Prior to making adjustments, the total sum due the United States, including unpaid interest, now exceeds \$6,000,000.

The following changes have occurred among officials of the government of Puerto Rico, who are appointed by the President:

Hon. Martin Travieso was confirmed as associate justice of the supreme court on March 19, 1936, succeeding Hon. Pedro de Aldrey, retired.

Hon. Benigno Fernandez Garcia was confirmed as attorney general on June 18, 1936, succeeding Hon. Benjamin J. Horton, resigned.

Much political unrest has existed in Puerto Rico, due in large part to long-standing unemployment and the real need of relief for the poorer people. Col. Francis E. Riggs, chief of the insular police, was

assassinated on February 23, 1936. The agitation continued, and eight of the Nationalist leaders were tried and convicted on charges of conspiring to overthrow the United States Government by force. Maj. Enrique de Orbeta, a native Puerto Rican, was appointed by the Governor to succeed Colonel Riggs and he assumed the duties of the office on June 2, 1936.

Three bond issues aggregating \$3,973,000 were sold on behalf of the government of Puerto Rico. Refunding bonds amounting to \$3,778,000 were awarded to the highest bidder at 100.209, to bear an interest rate of $2\frac{3}{4}$ percent per annum. The proceeds from this issue were used to retire seven outstanding issues, which were callable prior to maturity, and bearing higher rates of interest, thus making a substantial saving in interest charges.

ALASKA

Promoting the orderly development of Alaska's resources and the establishment on its 6,000 square miles of territory a greater permanent population, the Division of Territories and Island Possessions has been actively interested in all those factors of administration and legislation affecting the course of Territorial affairs.

Protection of the welfare of the native population, conservation and utilization of Alaska's natural resources, the increased local production of foodstuffs, better transportation facilities within the Territory and with continental United States, more equitable and better coordinated Federal appropriations, and more satisfactory conditions of service of Federal representatives residing in the Territory have appeared to be immediate considerations for the attainment of major ends. In these fields, the year has witnessed important and basic developments. The extension of the economic and social benefits of the Indian reorganization act to Alaska has paved the way for the security of approximately one-half of the present population of the Territory, whose stabilized future is not only an essential act of humanitarianism but also an important item of wholesome advance.

The Matanuska colony, under the auspices of the Federal Emergency Relief Administration, during its second summer has demonstrated that it is solidly established. Undoubtedly, the success of its settlers, as it becomes more thoroughly demonstrated, will lead to an increased agricultural population and a greater production of necessary foodstuffs. Already other farming districts, notably the Kenai Peninsula, report numbers of settlers who, upon individual initiative, have acquired homesteads. The ultimate effect of this development upon the economy, conditions of living, and pop-

ulation of the Territory cannot be overestimated. In keeping with this movement and enabling the Alaska University at Fairbanks to further demonstrate its value as an educational and service center, was the extension of the Adams, Purnell, and the Capper-Ketcham Acts to the Territory. Community service and agricultural demonstration activities, essential aids to pioneering effort, sponsored for several years by the university, can now be more adequately expanded.

The deliberations of the Inter-Departmental Committee have resulted in additional emphasis upon the conviction that the progress of Alaska and the needs of its population may better be served by the increased coordination of the plans and activities of the several departments represented in Alaska. In this connection, plans have been formed for a unified attack upon Alaska's transportation and budgetary problems with a view toward securing more adequate appropriation for the development of its natural resources, a better system of roads, additional air transportation aids, and more adequate harbor facilities. At the same time, overland transportation between Alaska and continental United States has taken an important step forward because of the enactment of a law authorizing the President to negotiate with the Canadian Government for the location, survey, and construction of an international highway.

Additional recognition of the value of local autonomy has been secured through the enactment of the law to enable incorporated municipalities to incur bonded indebtedness, thereby relieving Congress of the consideration of local problems in which it can have but causal interest and extending to organized local communities direct control of their financial programs.

Alaska Railroad employees, hitherto excluded from the benefits of any Federal retirement provision, by virtue of congressional action are now included in that body of Federal employees for whom cooperative retirement plans have been established. Needless to say, this legislation is considered by the personnel of the Alaska Railroad as a noteworthy accomplishment.

In these contributions to the welfare and development of Alaska, the Division of Territories and Island Possessions has taken active participation in directing the affairs of the Governor's office, the Alaska Road Commission, the Alaska Railroad, the Alaska Reindeer Service, in arranging for the care of Alaska insane, and through its liaison capacity in relationship to the other branches of the Department having activities in Alaska, as well as by its participation in the conferences of the Inter-Departmental Committee on Alaska and hearings of committees of Congress.

HAWAII

While the Territory of Hawaii is a comparatively self-contained political subdivision, the Division of Territories and Island Possessions has been concerned with several of its major problems.

By act of Congress of July 9, 1921, known as the Hawaiian Homes Commission Act, 1920, large areas of public lands of the Territory were set aside to be administered by the Hawaiian Homes Commission for the benefit of native Hawaiians, in order to rehabilitate the Hawaiian race and prevent the decrease and possible extinction thereof. Under an amendment to section 202 of this act passed by the Seventy-fourth Congress—Public 223—a new commission was appointed by the Governor to administer this activity. The Secretary of the Interior designated George K. Larrison as his representative to cooperate with the commission and to report on its activities directly to this Department. The new commission is proving to be energetic and enthusiastic in the discharge of its duties and there is every reason to believe that its businesslike management and vigorous enforcement of policies and regulations will prove beneficial to the Hawaiian people, and assure the continuance and possible expansion of the homes project.

As a further benefit to the Hawaiian people and in the interest of diversified farming and increased productivity for the approximately 40,000 acres which are administered by the Hawaiian Homes Commission on Molokai, a water survey was authorized by the Secretary of the Interior. The object is to determine the possibilities of diverting the flows of perennial streams located on the north side of East Molokai to supply the arable portions of the islands where the Hoolehua homesteads are located. When the present survey is completed, it will be definitely determined whether the proposed irrigation project is practical from the engineering point of view and also if the amount of land to be reclaimed will justify the expense involved.

During the fiscal year, the Territory has received generous allotments of funds from the Federal Government for relief and various construction projects. Also, under the provisions of Public Act 204 of the Congress of the United States, approved July 15, 1935, the city and county of Honolulu was authorized by the President during the fiscal year to issue bonds in the amount of \$700,000 for public improvements designed to control the floodwaters of certain valleys on the island of Oahu. The total amount of bonds authorized for issuance by the city and county of Honolulu was \$1,200,000, leaving a balance of \$500,000 to be expended, with the President's approval, during the coming fiscal year to complete the projects now under way.

PETROLEUM ADMINISTRATIVE BOARD

G. W. HOLLAND, *Director*

The duties of the Petroleum Administrative Board in assisting the Administrator for the Petroleum Industry in the administration of the Code of Fair Competition for the Petroleum Industry terminated with the decision of the United States Supreme Court on May 27, 1935, in the case of *United States v. Schechter Poultry Corporation* (295 U. S. 495).

From July 1, 1935, to April 1, 1936, in compliance with Executive Order No. 7076, the Board carried on studies and research with respect to the petroleum industry. Studies were completed and the following reports were published: Report on the Cost of Producing Crude Petroleum, Operation of New Pool Plans of Orderly Development Under the Code of Fair Competition for the Petroleum Industry, and the Final Report of the Marketing Division.

During the period from July 1935, to April 1, 1936, the Petroleum Administrative Board advised with the Secretary of the Interior on the enforcement of the act of Congress of February 22, 1935 (49 Stat. 30), generally known as the Connally Act, and so referred to hereinafter.

PETROLEUM CONSERVATION DIVISION

The Secretary of the Interior, by order no. 1054 dated March 14, 1936, established the Petroleum Conservation Division, effective April 1, 1936. The Division advises and assists the Secretary of the Interior in the enforcement of the Connally Act and in the administration of Federal Tender Board No. 1 and Federal Petroleum Agency No. 1; is authorized to discuss the work of any agency dealing with oil and gas; recommend action on any case brought to its attention; coordinate information; and, through appropriate channels, act as the contact agency with the Interstate Oil Compact Commission; present required data to the Congress; attend oil and gas conferences in which the Department is interested; cooperate with the oil-producing States in the study of physical waste and the enactment of uniform oil and gas conservation laws; and contact other departments of the Government whose work deals in any measure with oil and gas.

An interstate oil compact, ratified by the States of New Mexico, Colorado, Illinois, Kansas, Texas, and Oklahoma, was approved by Congress on August 27, 1935, and in response to a request from

the Interstate Oil Compact Commission, the Division assigned a member of the staff to work with a subcommittee of the Commission in an analysis, indexing, and compilation of State laws, with a view toward uniformity in State oil and gas conservation statutes.

The Rodessa field in Louisiana and Texas has been under observation, personnel of Federal Petroleum Agency No. 1 having been assigned to observe developments and to assist the States in oil and gas conservation and the prevention of the movement of contraband oil in interstate commerce.

FEDERAL TENDER BOARD NO. 1

The original Federal Tender Board which was established by the Secretary of the Interior on October 18, 1934, under authority of the National Industrial Recovery Act, approved June 16, 1933 (48 Stat. 195), was terminated by the decision of the Supreme Court of the United States dated January 7, 1935, on section 9 (c) of that act in the *Panama Refining Company case* (293 U. S. 388). Federal Tender Board No. 1, with headquarters at Kilgore, Tex., was established by Executive Order No. 6980-C, March 1, 1935, under authority of the Connally Act, and operates in a designated area known as the East Texas field, comprised of the counties of Gregg, Upshur, Smith, Rusk, and a part of Cherokee County.

The Board is required to issue certificates of clearance or tenders permitting the shipment in interstate commerce of petroleum and its products whenever it determines that the petroleum or petroleum products does not constitute contraband oil. Contraband oil is defined as petroleum which, or any constituent part of which, was produced, transported, or withdrawn from storage in excess of the amounts permitted to be produced, transported, or withdrawn from storage under the laws of a State or any regulation or order prescribed thereunder by any board, commission, officer, or other duly authorized agency of such State, or any of the products of such petroleum. Excess oil has been produced in the East Texas field since the first proration orders were issued by the State, estimates of excess production from the discovery of the field in October 1930 up to July 1, 1936, varying from 80,000,000 to 100,000,000 barrels. The amount of such excess production in June 1936 was estimated at 5,000 barrels daily, compared with 75,000 barrels daily in June 1935, a decline of 70,000 barrels.

The East Texas oil field, which has produced approximately 1,000,000,000 barrels of oil, is from 3½ to 10 miles wide and about 50 miles long. On July 1, 1935, it contained 124,000 productive acres; a year later, 130,000 acres. On June 30, 1936, there were 20,848 producing wells, a gain of 2,977 wells during the fiscal year. The

density of spacing changed from one well to 6.92 acres on July 1, 1935, to one well to 6.21 acres on June 30, 1936.

Approximately 90 percent of the crude oil produced in the field is transported to the Gulf coast through 14 pipe lines. Practically all of the remainder is refined in the field, the products being transported in tank cars and trucks.

On July 1, 1935, the Railroad Commission of Texas listed 73 refineries in the field, of which 28 were operating and 45 were shut down. On July 1, 1936, there were 59 refineries, 17 of which were operating and 42 were shut down. On July 1, 1935, there were 17 natural-gasoline plants as compared with 19 on July 1, 1936. The production of natural gasoline increased from 6,840 barrels to 10,000 barrels per day over the year.

The average gravity of east Texas crude oil is 39.5°. It has a paraffin-asphalt base and produces by skimming about 33 percent of gasoline and by cracking as much as 70 percent.

The posted price of crude oil was \$1 a barrel from July 1, 1935, until January 6, 1936, when it was raised to \$1.15 per barrel.

Under State authority the total allowable for the field was 160,476,943 barrels for the fiscal year, and the Railroad Commission of Texas reported actual production of 157,953,452 barrels, and the United States Bureau of Mines reported 173,580,000 barrels. The production of natural gasoline totaled 2,734,243 barrels, and the butane production 115,483 barrels. Reservoir pressure declined from 1,227.80 pounds per square inch on July 1, 1935, to 1,182.44 pounds per square inch on June 30, 1936, a decrease of 45.36 pounds per square inch. Crude oil production equaled approximately 3,500,000 barrels for each pound decline in pressure.

The production of gasoline and naphtha in the east Texas field totaled 8,322,169 barrels, kerosene 665,432 barrels, fuel oil and residuum 3,323,865 barrels, and gas oil and distillate 1,218,147 barrels during the fiscal year. Of a total of 16,379,339 barrels of petroleum products, including butane and natural gasoline, 12,226,761 barrels were shipped by tank car.

During the fiscal year, the Federal Tender Board received 6,207 applications for tenders, 3,789 being for permits to transport 209,131,673 barrels of crude oil, and of which 3,668 applications involving 207,569,560 barrels were approved, 103 involving 1,292,573 barrels were not approved, and 18 involving 269,540 barrels were pending as of June 30, 1936. There were 225 applications covering 3,218,567 barrels for tenders on natural gasoline, of which 214 involving 3,080,437 barrels were approved, 1 involving 5,256 barrels was not approved, and 10 involving 132,874 barrels were pending. Butane applications numbered 24, involving 203,429 barrels, of which 21 involving 156,682 barrels were approved, 3 involving 46,747 barrels

were pending. Applications for tenders on refined products numbered 2,169 involving 12,224,553 barrels; 2,065 involving 11,227,832 barrels were approved; 93 applications involving 914,244 barrels were not approved and 11 applications involving 82,447 barrels were pending at the end of the fiscal year. The following table summarizes the action taken by Federal Tender Board No. 1 and Federal Petroleum Agency No. 1 upon applications for certificates of clearance received during the fiscal year.

Applications for certificates of clearance, Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, July 1, 1935, to June 30, 1936

	Crude oil	Natural gasoline	Butane	Gasoline	Other refined products	Total
Received:						
Number.....	3,789	225	24	790	1,379	6,207
Barrels.....	209,131,673	3,218,567	203,429	6,653,054	5,571,499	224,778,222
Approved:						
Number.....	3,668	214	21	758	1,307	5,968
Barrels.....	207,569,560	3,080,437	156,682	6,443,821	4,784,011	222,034,511
Not approved:						
Number.....	103	1	0	28	65	197
Barrels.....	1,292,573	5,256	0	161,388	752,856	2,212,073
Pending (June 30, 1936):						
Number.....	18	10	3	4	7	42
Barrels.....	269,540	132,874	46,747	47,845	34,632	531,638

FEDERAL PETROLEUM AGENCY NO. 1

Federal Petroleum Agency No. 1, created by Executive Order No. 7024-B, dated April 25, 1935, under authority of the Connally Act, was designated by the Secretary of the Interior to exercise all duties and functions pertaining or incidental to investigations necessary to the enforcement of the Connally Act and to investigate and report on all applications for tenders. This agency was under the supervision of the Division of Investigations (oil enforcement) from the beginning of the fiscal year until May 1, 1936, when it was placed under the supervision of the Petroleum Conservation Division.

During the first 6 months of the fiscal year the Division of Investigations (oil enforcement) maintained eight offices, which on January 1, 1936, were reduced to four—namely, Kilgore and Houston, Tex., Chicago, and Washington.

The primary activity of the marine unit, with headquarters at Houston, Tex., during the fiscal year was to obtain information covering shipments of petroleum and petroleum products. By May 1, 1936, four motorboats formerly under the direction of several regional offices had been transferred to Houston. In June the marine unit was reduced to one boat in active service and two boats in storage, one boat having been transferred to the National Park Service.

The Chicago office during the fiscal year ended June 30, 1936, confined its activities to investigations of inbound shipments of petroleum products from producing areas which came under the jurisdiction of the oil enforcement unit. A periodical check of railroad records and marine terminal records was made. An average of approximately 70 cases per month was investigated.

During the fiscal year, the agency received from the tender board 6,207 applications, involving 209,131,673 barrels of crude petroleum, 6,653,054 barrels of gasoline, and 8,993,495 barrels of other products. Examination of these tenders resulted in 5,968 being reported on favorably to the board, 197 not approved, and, as of June 30, 1936, 42 were pending. The 197 applications not approved included those withdrawn by applicants, those rejected, and those filed by the board without action.

During the year, the agency discovered many trucks transporting East Texas crude oil without Federal tenders from Texas to Louisiana for delivery to refineries in that State. For the period, 125 criminal cases were developed and approximately 75 percent of the violators were apprehended after warrants were issued. Cases were developed and presented against the Louisiana refineries receiving this oil and injunctions obtained.

A special investigation of the Conroe field, with respect to contraband oil, was started on January 13, 1936, but was not completed at the end of the fiscal year.

Throughout the fiscal year, continuous efforts were made by the agency to detect criminal violations of the Connally Act and to prepare and present cases to the Department of Justice. From October 1935 to the end of the fiscal year, 396 investigations were assigned to members of the staff and 196 cases were referred to the Department of Justice.

Federal authorities and the Railroad Commission of Texas have cooperated in the investigations made pursuant to Federal and State law.

During the fiscal year funds available for the Petroleum Administration of the Department of Interior, including the Petroleum Administrative Board, Petroleum Labor Policy Board, Petroleum Conservation Division, Division of Investigations, Federal Tender Board No. 1, and Federal Petroleum Agency No. 1, totaled \$714,361, which was obligated for \$565,632, leaving an unexpended balance of \$148,729 as of June 30, 1936. The gross fund was comprised of allotments of \$214,361 from National Industrial Recovery and Public Works Administration, and of a direct appropriation of \$500,000 in the deficiency bill approved August 12, 1935. Of the allotted funds the Petroleum Administrative Board obligated \$167,659 and the Petroleum Labor Policy Board obligated \$27,749, leaving an unex-

pending balance of \$18,953 when the activities of these agencies terminated on March 31, 1936. From April 1 to June 30, 1936, the Petroleum Conservation Division obligated the deficiency appropriation for \$15,560, and during the entire fiscal year this appropriation was obligated for \$206,913 by the Federal Tender Board No. 1 and the Federal Petroleum Agency No. 1, and for \$147,751 by the Division of Investigations (oil enforcement), leaving an unexpended balance of \$129,776.

As of July 1, 1935, the Petroleum Administration had 263 employees, 110 with the Petroleum Administrative Board, 17 with the Petroleum Labor Policy Board, 54 with Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, and 82 with the Division of Investigations (oil enforcement). At the end of the fiscal year the number of employees had been reduced to 97, of which 19 are in Washington and 78 in the field. The appropriation available for the year beginning July 1, 1936, has been reduced to \$300,000 and personnel adjustments pending at the close of the fiscal year have resulted in a further reduction in the number of employees.

The following table shows the expenditures made of available funds:

Personal services

	Emergency fund	Appropriation	Total
Agency:			
Division of Investigations (Oil Enforcement).....		\$107,564	\$107,564
Petroleum Conservation Division.....		14,060	14,060
Petroleum Administrative Board.....	\$140,075		140,075
Petroleum Labor Policy Board.....	22,763		22,763
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1.....		153,376	153,376
Total.....	162,838	275,000	437,838
Miscellaneous:			
Materials and supplies.....	2,313	27,351	29,664
Communication.....	2,345	3,565	5,910
Travel.....	13,290	35,556	48,846
Transportation of things.....	65	1,679	1,744
Printing and binding.....	2,586	4,922	7,508
Rent of buildings.....	11,567	8,102	19,669
Repairs and alterations.....	362	119	481
Equipment.....	42	13,640	13,682
Not otherwise classified.....		290	290
Total obligated.....	195,408	370,224	565,632
Unobligated.....	18,953	129,776	148,729
Total funds available.....	214,361	500,000	714,361

	Washington office	Field	Total
Personnel as of June 30, 1935:			
Petroleum Administrative Board.....	101	9	110
Petroleum Labor Policy Board.....	17		17
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1.....		54	54
Division of Investigations.....	21	61	82
Total.....	139	124	263
Number of employees as of June 30, 1936: Petroleum Conservation Division (including Federal Petroleum Agency No. 1 and Federal Tender Board No. 1).....			
	19	78	97

WAR MINERALS RELIEF COMMISSION

ROSCOE FERTICH, *Commissioner*

Acting under the War Minerals Relief Act (40 Stat. 1272) as amended February 13, 1929 (45 Stat. 1166), the Secretary of the Interior made 26 awards and 7 disallowances during the fiscal year ending June 30, 1936.

Six awards, totaling \$5,840.61, carried over from the previous fiscal year, and 13 awards, totaling \$83,582.17, made during the present fiscal year, were paid through the Treasury deficiency appropriation (Public, No. 440, 74th Cong., approved Feb. 11, 1936); and 7 awards, totaling \$19,800.68, were paid through the Treasury deficiency appropriation (Public, No. 739, 74th Cong., approved June 22, 1936). A total of \$109,223.46 was paid during this fiscal year.

Six awards, totaling \$21,395.33, were certified to the General Accounting Office prior to June 30, 1936, to be paid through a future Treasury deficiency appropriation.

Record of cases filed under the act as amended Feb. 13, 1929

Total cases filed.....			348
Total cases dismissed by Supreme Court of District of Columbia.....			67
Decisions by the Secretary of the Interior:			
	<i>Awards</i>	<i>Denials</i>	
To June 30, 1935.....	139	13	
July 1, 1935 to June 30, 1936.....	25	7	
	<hr/>	<hr/>	
	164	20	
	<hr/>	<hr/>	184
Cases pending:			
In Supreme Court of the District of Columbia.....			74
Decrees by Supreme Court of the District of Columbia, pending in			
War Minerals Relief Commission June 30, 1936.....			23
			<hr/> 348

ACTION IN THE SUPREME COURT OF THE DISTRICT OF COLUMBIA

Thirty-four cases were heard and dismissed upon final order of the court, which held: (1) Conduct of milling and smelting operations and the manufacture of ferro-alloys not to be within the meaning of the War Minerals Relief Acts; (2) profits in one operation by a claimant may be considered in arriving at a net loss in all

operations by a single claimant; (3) failure of plaintiff to prosecute cases; (4) claims not assignable by operation of law, and death of claimant and dissolution of corporation relieved the Government of liability under the act; (5) that the court could not review as matter of law an item not considered by the Secretary of the Interior.

Ten decrees were entered by the court during the fiscal year ending June 30, 1936, authorizing the Secretary of the Interior to review previous decisions made by him.

ACTION IN THE COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA

Néil Crowley, as receiver of the Cuyuna-Minneapolis Iron Co., no. 6537, March 23, 1936: Court upheld the right of a receiver to prosecute the claim under the 1929 amendment of the Relief Act.

W. L. Gazzam, no. 6602, March 30, 1936: Court remanded the case to Supreme Court of the District of Columbia to give petitioner opportunity to show his right to sue on the claim and to receive the award—if one is made—on the partnership's behalf.

Tungsten Reef Mines Co., no. 6554, May 11, 1936: Court sustained a decision of the Supreme Court of the District of Columbia that an item of loss was not subject to review by that court as a matter of law unless the item had been previously considered and denied by the Secretary of the Interior.

IN THE SEVENTY-FOURTH CONGRESS

Amendments to War Minerals Relief Act of March 2, 1919 (40 Stat. 1272):

Public, No. 602, approved May 18, 1936, authorized the Secretary of the Interior to open or reopen previous decisions to include interest paid or accrued to the date of passage of the act when proven to his satisfaction to be allowable losses within the meaning of the Relief Act of March 2, 1919, as amended. This act sets a limitation of \$1,250,000 for this purpose. An appropriation of \$500,000 was included in the deficiency appropriation (Public, No. 739, approved June 22, 1936).

Seven claims were filed under this act, before June 30, 1936.

Public, No. 847, approved June 30, 1936, authorized claimants who failed to file suit under the 1929 amendment of the Relief Act to petition the Secretary of the Interior to review their claims upon matters of fact in the light of decisions of the court in similar cases, and to make awards; and provided for the rights of deceased claimants to descend to legal successors; and provided for the rights of dissolved corporations to descend to any officer, director, stockholder, or legal representative who shall be entitled to benefits of this act: *Provided*, That such claims be filed within 6 months of approval of this act.

NATIONAL BITUMINOUS COAL COMMISSION

C. F. HOSFORD, Jr., *Chairman*

By the Bituminous Coal Conservation Act of 1935, approved by the President on August 30, 1935, there was created in the Department of the Interior a National Bituminous Coal Commission, the five members of which were duly appointed by the President on September 21, 1935.

The basic act specified that the provisions of section 4 "shall be formulated by the Commission into a working agreement to be known as the Bituminous Coal Code." Immediately after its organization on September 28, 1935, the Commission proceeded to the formulation of the code and by its order no. 1, dated October 9, 1935, promulgated the code. This was followed by the issuance to producers of forms of acceptance of the code, and on May 18, 1936, acceptances had been received from 4,332 producers whose 1934 tonnage totaled 251,745,140 tons and constituted 70 percent of the entire national production.

The act divided the coal fields of the United States into 23 districts and, for the purpose of establishing minimum prices, grouped these districts into 9 minimum price areas. On October 9, 1935, the Commission issued instructions for the election of members of the 23 district boards of coal producers, as provided in the act, and by November 1, 1935, district boards had been organized in practically all districts. These district boards, under the general supervision of the Commission, were required to assist in the establishment of minimum prices and in the general administration of the act.

One of the major functions of the Commission was the establishment of minimum prices for all kinds, qualities, and sizes of coal produced and marketed in the United States, and prior to the decision of the Supreme Court in the case of *Carter v. Carter Coal Company et al.* rendered on May 18, 1936, the Commission had completed a large part of the work incident to the establishment of minimum prices in all minimum price areas and had actually established and put into effect minimum prices in some of the western price areas. In order to facilitate the compiling of statistical information necessary to the establishment of minimum prices the Commission directed

the organization of statistical bureaus in each of the districts. These bureaus collected from the code members within the respective districts data on producing costs as required by the act and submitted the compilations therefrom to the Commission, which computed the weighted average cost of production for the various minimum price areas and reported its findings to the district boards for use in the determination of proposed minimum prices for all kinds, qualities, and sizes of coals produced within the respective districts. As a further step in the establishment of minimum prices the Commission directed the classification of all coals of all code members within the various districts, and, prior to the establishment of minimum prices for a price area, required representatives of all district boards within the minimum price area to coordinate proposed minimum prices in the various common consuming markets, under the direction of the Commission. In addition to these informal conferences, formal public hearings were held in Washington as well as in the producing fields relative to the establishment of minimum prices. When the Supreme Court decision of May 18, 1936, invalidated the minimum price provisions of the act, the work necessary to the establishment of minimum prices for coals produced in minimum price area no. 1, which comprised approximately 90 percent of all coal produced in the United States, was practically completed.

Under authority of section 18 of the basic law, the Commission, in conjunction with the consumers' counsel, opposed before the Interstate Commerce Commission the application of the class I railroads in the United States for a continuance of emergency freight surcharges on bituminous coal beyond their original expiration date, June 30, 1936 (I. C. C., Ex parte 115). These surcharges were conservatively estimated as amounting to \$30,000,000 annually and constituted a very heavy burden on a depressed industry and on the consumers of bituminous coal, with the additional effect of reducing the coal tonnage shipped by rail. The Commission was represented at hearings and also submitted testimony and exhibits to the Interstate Commerce Commission in support of the position taken. In addition, it filed a brief jointly with the consumers' counsel setting forth both the detailed factual evidence and the arguments against any continuance of the freight surcharges on bituminous coal.

The decision of the Interstate Commerce Commission in this matter, handed down on June 9, 1936, denied the petition of the railroads for a continuance of the surcharges indefinitely beyond June 30, 1936. It authorized a temporary extension for 6 months but required a reduction during this period in the maximum surcharge on coal and coke from 15 cents to 10 cents per ton. This decision will, in a degree, relieve the bituminous-coal industry of a heavy burden

and will represent savings of millions annually to consumers of bituminous coal.

During the year the Commission initiated studies and investigations required under section 16 of the act, which section reads as follows:

SEC. 16. The Commission shall study and investigate the matter of increasing the uses of bituminous coal and the problems of its importation and exportation; and shall further investigate—

(1) The economic operation of mines with the view to the conservation of the national coal resources.

(2) The safe operation of mines for the purpose of minimizing working hazards, and for such purpose shall be authorized to employ the services of the Bureau of Mines.

(3) The rehabilitation of mine workers displaced from employment, and the relief of mine workers partially employed. The Commission's findings and recommendations shall be transmitted to the proper agency of the Government for relief, rehabilitation, and subsistence homesteads.

(4) The problem of marketing to lower distributing costs for the benefit of consumers.

(5) The Commission shall, as soon as reasonably possible after its appointment, investigate the necessity for the control of production of bituminous coal and methods of such control, including allotment of output to districts and producers within such districts, and shall hold hearings thereon, and shall report its conclusions and recommendations to the Secretary of the Interior for transmission by him to Congress not later than January 6, 1936.

The work of the Commission in the immediate future will be limited to the consummation of the studies required under section 16 of the act and to the continued representation of the bituminous coal industry before the Interstate Commerce Commission as provided under section 18 of the act. By a decision of the Comptroller General of the United States, dated May 25, 1936 (A-75704), it was held that these sections of the act were in nowise impaired by the decision of the Supreme Court invalidating certain provisions of the statute.

At no time has the staff of the Commission reached the quota anticipated due to the fact that numerous court actions directed by producers against the collection of the tax provided for in section 3 of the act and the injunctions granted by the courts in many of these cases seriously impeded the work of the Commission, and also because it was not until February 11, 1936, that the bill appropriating funds for the use of the Commission was passed by Congress. Prior to that time the Commission operated with a skeleton organization borrowed from the National Recovery Administration. Following the decision of the Supreme Court the staff of the Commission has been reduced to the number necessary for completion of the various studies being conducted.

The Bituminous Coal Conservation Act of 1935 was the first Federal statute enacted to regulate a major natural resource industry by

the establishment and enforcement of minimum prices, and although the injunctions obtained by various producers and the decision of the Supreme Court invalidating its price provisions made the act inoperative to a large extent, nevertheless the work of the Commission and the data compiled as to conditions in the industry will prove of definite value in determining upon a regulatory program within the constitutional limitations upon the power of Congress to deal with the broad subject of conservation of natural resources and regulation of natural resource industries.

OFFICE OF EXHIBITS

G. C. DICKENS, *Supervisor*

Government participation through exhibits in State, national, and international expositions and at numerous scientific and otherwise educational conventions has become an established policy. One important function of all Government departments and independent establishments should be to acquaint the general public insofar as possible with the many and varied activities being carried on by them, and to inform the public of the services rendered by each department and establishment.

Experience has proved that one of the best methods by which the public may be made acquainted with the activities and services of the Government is provided by participation in expositions and the other gatherings above described. In carrying on this work the use of motion pictures, animated dioramas and models, stereopticon slides and colored transparencies, and murals has proved to be highly successful and adaptable. Further, in making presentations relating to our island and territorial possessions, and the American Indian, experience has developed that the display and use of native handicraft is both desirable and important.

In the past, with exception of one Government department, there has been no organized effort throughout the various Government departments and establishments to plan, coordinate, and supervise the activities of the various bureaus, divisions, and offices in each department and establishment in connection with Government participation in expositions. Such participation having become an established policy, however, as indicated above, and expositions having become so regular and frequent, it has been deemed advisable by several of the Government departments to establish an exhibits office to plan, coordinate, and supervise the exhibits and displays which will portray the work of the bureaus in each of the departments and establishments. With the appointment of a supervisor of exhibits by the Secretary of the Interior under date of February 1, 1936, an Office of Exhibits under the Secretary's office was established, and the official referred to has supervision over the Department's exhibits at the California Pacific International Exposition, the Texas Centennial Exposition, and the Great Lakes Exposition. Further, the Office of Exhibits, through its diorama

and model studio, is constantly at work preparing additional and new exhibit material, and is already making preliminary and tentative plans relating to the forthcoming San Francisco and New York expositions.

Further, for distribution from Washington and at the Department's exhibits at various expositions the Office of Exhibits during the past few months, with the valuable assistance of the various bureaus within the Department, and the assistance as well of the Public Works Administration and the National Resources Committee, compiled a booklet entitled "Back of the Buffalo Seal", which contains printed matter and pictures descriptive of the work of the several organizations which are under the jurisdiction of the Secretary of the Interior.

The results obtained thus far have quite clearly demonstrated the desirability and importance of an Office of Exhibits in the Interior Department, and it is believed that future developments will tend to demonstrate this fact even more conclusively.

DIVISION OF MOTION PICTURES

FANNING HEARON, *Acting Director*

The Division of Motion Pictures was established on November 25, 1935, by Order No. 1005-A. This order consolidated the motion and still picture activities and personnel of the Department, except the cooperative production of the Bureau of Mines and the specialized work of the Geological Survey.

The major purpose of the Division has been to provide educational film service for C. C. C. camps under technical supervision of the Department. This has been accomplished by production, purchase, and distribution of suitable films.

Another important purpose of the Division has been that of producing still and motion-picture records of the activities of the Department and of the C. C. C. for their record value and for educational use. The motion pictures are being used extensively by schools and other nontheatrical institutions. Prints from still negatives are used by newspapers, magazines, and book publishers. Enlargements are prepared for decorative use among Government offices, and for educational exhibits.

Other departments and bureaus have requested and received the cooperation of the Division in the production and distribution of motion and still pictures of their activities. This has included cooperation with the Veterans' Administration, Department of Commerce, Emergency Conservation Work, Resettlement Administration, and others.

The physical equipment of the Division includes two adjoining photographic laboratories, an enlarging laboratory, a motion-picture laboratory, and facilities for the proper storage, care, and distribution of finished films and pictures. The laboratories are equipped to accomplish all ordinary and many special requirements.

Exhibitions of motion pictures loaned by the Division during the past year were attended by more than 1,000,000 persons in C. C. C. camps, schools, colleges, and other institutions. Untold millions saw still pictures of the national parks, reclamation projects, and Indian activities. Enlargements and special exhibits of photographs have been on display throughout the United States. There have been many more requests for films, slides, and photographs than could be accommodated.

The Division is well organized and efficiently equipped to take an important part in that vital program which the Federal Government is approaching effectively—that of keeping the people intelligently and impartially informed of its far-flung activities.

THE ADVISER ON NEGRO AFFAIRS

ROBERT C. WEAVER, *Adviser*

The activities of the office of the Adviser on Negro Affairs may be divided into two groups: Those matters which concern the Department of the Interior and the Public Works Administration; and those things which are outside the direct province of the Department of the Interior and the Public Works Administration.

This office has watched constantly the employment of Negro skilled and unskilled labor on Public Works Administration projects. In this connection it suggested, and had approved, at the initiation of the program of the Housing Division a nondiscrimination clause which establishes prima facie evidence of discrimination. It has cooperated with the Labor Department in effecting negotiations with local union officials, and has investigated local labor conditions so as to determine the availability of qualified Negro workers. During the last year, 10 Public Works Administration housing projects have been submitting monthly reports to the Adviser on Negro Affairs relative to the operation of this clause. To date four projects are practically completed, and in each instance the compliance with the nondiscrimination clause has been obtained. In this work the cooperation of the Inspection Division and the Labor Relations Division of the Public Works Administration has been most helpful. On the basis of past experience, the clause based on prima facie evidence of discrimination has proven to be a successful means of protecting Negro labor on Federal projects.

In addition to the work in relation to labor policy and practices on housing projects, the Adviser on Negro Affairs has kept in touch with the Housing Division and has cooperated with that division in handling matters of policy in relation to plans for the management of low-rent housing projects. He and his staff have visited these projects when the need has arisen, and have kept abreast of developments in connection with the housing program of the Public Works Administration. On general Public Works Administration projects the office of the Adviser on Negro Affairs has supplemented and cooperated with the work of the Labor Relations Division of the Public Works Administration in an effort to prevent and correct discrimination against Negro labor. This office has gathered data relative to Public Works Administration projects designed for Negro

occupancy or use, and has disseminated this information when requests have been received.

In January of 1936 the Works Progress Administration granted an allotment to the Adviser on Negro Affairs for the initiation of a white-collar survey among Negroes. This allotment provided for the expenditure of \$467,042, to be used for a survey of the training and employment of Negro white-collar and skilled workers. This office was sponsor for the project, and the Adviser on Negro Affairs is the administrator of the survey. The survey operated in 87 cities in 30 States and the District of Columbia. All field work has been completed. Editing, coding, and tabulation will be conducted in New York City and Nashville, Tenn. At the peak of production the survey gave employment to 1,899 workers. Of this number 315 were nonrelief, and 1,584 were relief. At the request of local Works Progress Administration administrators and of workers formerly connected with this survey, the office of the Adviser on Negro Affairs is planning to submit additional surveys which will be sponsored by this office, and will give employment to workers who have not yet been absorbed in the white-collar projects of the Works Progress Administration.

In the fall of 1935, at the request of the Tennessee Valley Authority, the Adviser on Negro Affairs made a survey of the Tennessee Valley Authority. This study concerned itself with the program of the Tennessee Valley Authority and its relation to the Negro community and the Negro farmer. It also made specific recommendations relative to housing, employment, and classification of Negro workers attached to the Tennessee Valley Authority.

The Adviser on Negro Affairs has interested himself in the promotion of qualified Negro employees in the Public Works Administration and the Department of the Interior. He conducted recently a survey of the employment status of Negroes in these departments in an effort to advise more effectively in this connection. In instances where complaints of discriminatory practices have been voiced, the office of the Adviser on Negro Affairs has stimulated investigations and reviewed corrective measures undertaken.

In March of 1936 the Associate Adviser on Negro Affairs investigated charges of discrimination on the Coulee Dam Project. As result of his trip and negotiations, Negroes have been employed on that project. In spite of the fact that the dam is located in an area in which few Negroes reside and labor is being taken from persons living in areas contiguous to the project, there has been a steady increase in the number of Negro workmen employed on the project since the initial employment of a Negro laborer was made as result of the activities of this office.

The Adviser on Negro Affairs has maintained his contacts with other governmental agencies and has submitted memoranda, suggestions, and advice to these agencies in response to their requests. He has prepared speeches and articles relating to the impact of the program of the Public Works Administration upon Negroes and has cooperated with the United States Information Service in answering a hundred or more requests relative to various phases of the Negro's economic, educational, and social status in this country.



BUREAU OF RECLAMATION

JOHN C. PAGE, *Acting Commissioner*

Dwindling revenues have emphasized the necessity for increasing the number of sources from which flow the funds for reclamation. In 1902, when Federal responsibility toward the arid and semiarid western public land States was recognized with the enactment of the Reclamation Act, the sale of public lands constituted an important source of revenue. Funds from this source were relied upon to make the then new reclamation policy effective.

Today the situation is entirely altered. Salable public lands have been exhausted. The remaining public domain has been withdrawn, and a new policy has been established with regard to it. Nearly all of it has been set aside as a permanent public range to be administered by the Federal Government and conserved for perpetual use by the people. This was a logical step, long overdue, but now that it has been taken it focuses sharply the imperative need for the discovery of new sources of revenue to the reclamation fund.

Revenues to the reclamation fund from the sale of public lands have dropped from \$9,430,573.98 in 1908 to \$154,567.65 this year. During this long period of diminishing revenue from this source, Congress has recognized the need for added sources of revenue to the reclamation fund. A very valuable addition was made by the Oil Leasing Act of February 25, 1920. Royalties received from the exploitation of oil on the public domain in 1924, added \$6,693,908.15 to the reclamation fund. This year only \$2,053,152.48 was received due to effective application of an oil conservation policy. Thus, the one important supplementary revenue to the reclamation fund is seen to be diminishing.

The only revenue to the reclamation fund which can be called stable at this time is that received from repayment of project construction costs by those benefiting. A moratorium granted and extended by Congress has postponed or curtailed these repayments for a space of 6 years. Even with the resumption of the annual repayments in full, and this resumption is an immediate prospect, revenues to the reclamation fund will be insufficient due to the vanishing receipts from other sources, to uphold the long-recognized responsibility of the Federal Government toward these arid and semiarid public land States. There can be no overemphasis of the immediate urgency of the requirement for augmented revenues to the reclamation fund.

WORTH OF POLICY PROVED

The value of the Federal reclamation policy in knitting together the western third of the Nation, in sustaining the people and in stabilizing the agriculture of the far western States, in moderating the effects of droughts and similar disasters has been demonstrated repeatedly in recent years. The 1935 crop season was one of about normal precipitation throughout the West. It followed an acute drought of the previous year, and preceded what appeared to be (at the end of the 1936 fiscal year) another drought of great severity. There was sufficient water for all Federal reclamation projects in 1935, just as there had been during the drought of 1934, and prospects for the 1936 irrigation season, despite the threatened drought, were good. Federal projects are prosperous. Only two projects went into the 1936 season with low reservoirs, and the visible stored water supplies for these was sufficient to eliminate the possibility of serious losses.

CONSERVATION OF SMALL STREAMS

The time has arrived when serious consideration must be given to an additional conservation activity in the arid and semiarid west; namely the control of the floods of small streams and the preservation of their waters for beneficial use. The extended period of deficient rainfall, now 7 years long, has emphasized the importance of this work. Failure to control and to use this resource is an offense against the theory of conservation as well as an economic loss. State authorities have investigated possibilities presented by their small waters. They have reported finding several hundreds of opportunities for construction of small reservoirs costing from \$5,000 to \$50,000 and serving from a few hundred to a few thousand acres. If this work is to be fitted into the national plan for control of floods, regulation of streams and beneficial use of water supplies, the Bureau of Reclamation logically must be the agent through which this is effected. Investigation should be made by the Bureau to determine the extent of these opportunities and the feasibility of projects on small streams. Standard designs should be made for structures suitable for these small developments, and standard plans mapped out for construction of these projects.

IMPROVED CONDITIONS OF FEDERAL PROJECTS

The Operation and Maintenance Division, newly organized, assisted materially during the year in establishing closer contacts with the operating projects and creation of a better attitude on the part

of water users. Federal projects generally were in an improved condition as a result of increased settlement. Irrigated farms attracted many from among those who were looking for new opportunities as a result of general improvement in the agricultural outlook and those who previously were dry farmers but who were dislodged by the drought of 1934. On the Owyhee project in Oregon 107 public land farm units were offered. In addition, 27 were offered on the Vale project in the same State and 28 on the Sun River project in Montana. Settlement proceeded quite satisfactorily.

CONSTRUCTION PROGRAM GOES FORWARD

The great construction program of the Bureau of Reclamation went forward expeditiously throughout the year. Three storage dams, begun since emergency funds first were made available, were completed and put in service. They are the Rye Patch Dam of the Humboldt project, the Hyrum Dam of the Hyrum project, and the Agency Valley Dam of the Vale project. These dams already are stabilizing important communities in the States of Nevada, Utah, and Oregon, respectively.

LAKE MEAD

The death of Dr. Elwood Mead, for more than a decade Commissioner of Reclamation, on January 26, 1936, was a severe loss to the Bureau of Reclamation and the country. To commemorate his fine, long service to the West he loved, the Division of Geographic Names gave the name Lake Mead to the great body of water created by Boulder Dam on the Colorado River. This lake, already the largest artificial lake in the world, grew steadily larger throughout the year, until it reached a length of 91 miles at the close of the fiscal year. At capacity it will be 115 miles long.

CONSTRUCTION ACTIVITIES DURING FISCAL YEAR

During the fiscal year, an extensive construction program was prosecuted with funds remaining from the Public Works allotments and with additional funds allocated by the Emergency Relief Administration. There were constructed 160.2 miles of roads, 1.6 miles of railroad, 55.3 miles of transmission lines, 523.1 miles of canals and drains, 40 tunnels with a total length of 46,022 feet, 4,875 canal structures, 192 bridges, and 630 culverts. There were excavated 46,107,497 cubic yards of earth and rock, making the total to date 402,317,184 cubic yards. The Bureau used 1,159,958 barrels of cement and placed 890,959 cubic yards of concrete. Construction of

five storage dams and one diversion dam was started. The Denver office organization exceeded 800 employees for the increased activities and a continuation of the design and specification work for the Tennessee Valley Authority.

Boulder Dam was accepted as complete from the Six Companies, Inc., March 1, and the work under the contract with Babcock & Wilcox is still in progress. Installation of electrical equipment and machinery in the power-house has been continued throughout the year with Government forces. Storage in Lake Mead reached a maximum of 8,978,000 acre feet on June 30.

Construction work on the Columbia Basin project, Washington, has been the major undertaking during the year. The principal contractors, Mason-Walsh-Atkinson-Kier, have excavated 6,272,100 cubic yards of earth and rock by means of the belt-conveyor system, and have completed the aggregate and cement storage and concrete mixing plants. In the west abutment section, which rises more than 90 feet above bedrock, 625,000 cubic yards of concrete have been placed.

The Columbia River highway bridge, including realinement and enlargement of the pier due to movement of the east river bank, has been completed. Dormitories, residences, a garage, and fire station have been constructed, and sidewalks and street paving have been completed in the Government camp site.

Construction is under way on the Casper-Alcova project, Wyoming. W. E. Callahan and Gunther & Shirley were awarded the contracts for construction of tunnels nos. 3, 4, 5, and 6 and Alcova Dam. Seminole Dam is being constructed by the Winston Bros., Morrison-Knudsen, and Utah Construction Cos., under a \$2,759,804 contract. Schedules 1, 2, and 3, covering earthwork, tunnels, and structures of the Casper Canal, have been completed. Government buildings at Seminole Dam site and residences at both the Alcova and Seminole sites are under construction by Dutlox, Kendall & Hunt, Inc., of Denver, Colo.

During the year, 28,500,000 cubic yards have been excavated, which totals 39,678,000 cubic yards to date on the All-American Canal. Work has been continued by the W. E. Callahan and Gunther & Shirley Cos. and by Lewis Chambers Co., and Mittry Bros., on their contracts, which were started in July 1935. The Morrison-Knudsen, Utah Construction Co., and Winston Bros. are constructing the Imperial Dam and desilting works under a contract amounting to \$4,374,240 and the concrete aggregates for the structures are being prepared by the Triangle Rock & Gravel Co. and Charles Holmes, who were awarded a contract on their bid of \$149,900.

The Malheur River and Dead Ox siphons have been completed on the Owyhee project by Parker-Schram, Consolidated Steel Corporation, and J. A. Terteling & Sons, and numerous contracts have been in force for earthwork and structures for both the north and south canals and laterals. Principal contractors have been Morrison-Knudsen Co., who held three contracts totaling \$236,294; J. A. Terteling & Sons, whose seven contracts amounted to \$112,407; and George B. Henley, whose seven contracts totaled \$62,675.

On the Carlsbad project, New Mexico, work was started on the construction of the Alamogordo Dam, a 135-foot earth-fill structure across the Pecos River in De Baca County, which will store 115,000 acre-feet of water for the irrigation of lands in the vicinity of Carlsbad. The contractor on the dam is the Hallet Construction Co., of Crosby, Minn., and the contract price is \$1,132,547. The contract was 15 percent complete at the end of the year.

Construction of the Island Park Dam, an 85-foot earth-fill dam, was started on the Upper Snake River Storage project, Idaho, to form a reservoir on Henrys Fork with a capacity of 114,000 acre-feet. The contract, awarded to the Max J. Kuney Co. of Spokane on its bid of \$478,838, was 14 percent complete at the end of the year. Reservoir cleaning is being done by the Nevada Construction Co., of Nevada, Mo., for \$66,890.

In Wyoming work was started on the Bull Lake Dam, a 75-foot earth-fill structure, to store 155,000 acre-feet of water for the Riverton project. The contract, which was awarded to the S. J. Groves & Sons Co. of Minneapolis at a price of \$653,398, was 7 percent complete at the end of the year. Work was also under way on the distribution system for 35,000 acres of land on the Heart Mountain division of the Shoshone project. A contract for the construction of three tunnels on the Shoshone Canyon conduit was awarded to the Utah Construction Co. of Ogden, Utah, at a price of \$614,510, on which the work was 18 percent completed.

Contracts were awarded for the construction of Caballo Dam on the Rio Grande project, New Mexico, and of the Unity Dam on the Burnt River project, Oregon. The successful bidder on Caballo was Mittry Bros. Construction Co. of Los Angeles, and on Unity it was J. A. Terteling & Sons of Boise. The bid prices were \$957,018 and \$273,989, respectively. Work had not been started on either at the end of the year.

In Arizona major work was started on two projects. Work was inaugurated on the Gila Valley project with the beginning of construction on the main canal by Boyce & Igo, of Baton Rouge, under a \$273,600 contract, and by Mittry Bros. Construction Co., of Los Angeles, under a \$681,575 contract. On the Salt River project im-

provement work on two dams was started. The Allied Bridge & Construction Co. of Omaha and the Central Bridge & Construction Co. of Wahoo, Nebr., are making alterations on the spillway of Stewart Mountain Dam for a price of \$150,724, and Dan Teeters & Co. of Garnet, Calif., are making spillway alterations at Roosevelt Dam for \$53,930.

Major work on canals and laterals was started during the year on several other projects. On the Payette division of the Boise project, J. A. Terteling & Sons of Boise has a \$292,415 contract for tunnel construction. On the Roza division of the Yakima project, Washington, the Morrison-Knudsen Co. has a \$993,840 contract for tunnel construction, and J. A. Terteling & Sons has a \$275,213 canal construction contract. J. A. Terteling & Sons has a \$424,978 contract for canal construction on the Ogden River project, Utah. On the Sun River project, Montana, Martin Wunderlich of Jefferson City, Mo., completed a contract for canal construction, which he was awarded on a bid of \$211,085. In addition, construction of laterals was started by T. G. Rowland of Salt Lake City, Utah, and by Rue Bros., of Bismarek, N. Dak., on contracts of \$43,531 and \$78,882, respectively.

Improvements were started on the Arrowrock Dam on the Boise project and the Kachess Dam on the Yakima project. The Arrowrock Dam is being raised 5 feet by T. E. Connolly of San Francisco, for a contract price of \$395,040. At Kachess, John Klug, of Nyssa, Oreg., is constructing a spillway on a contract awarded at a bid price of \$48,778.

Three dams in addition to Boulder were completed during the year. The 75-foot earth fill Rye Patch Dam on the Humboldt project, Nevada, was completed in June. Agency Valley Dam, a 93-foot earth fill structure on the Vale project, Oregon, was completed in December 1935. The contract for the construction of the 90-foot earth fill Hyrum Dam on the Hyrum project, Utah, was completed in August 1935.

In addition to Grand Coulee there were four dams still under construction at the end of the year on which work had been started previously. Work on Parker Dam, which is being constructed for the Metropolitan Water District of Southern California, was under suspension at the beginning of the year but was resumed in October, and by the end of the year the contract was about 25 percent complete. In Utah, work was carried on throughout the year at the Pine View Dam on the Ogden River project but, owing to the heavy snow, work was suspended for several weeks during the early spring on the Moon Lake Dam of the Moon Lake project. Work on the

Taylor Park Dam on the Uncompahgre project, Colorado, was suspended for several months during the winter because of snow, but was resumed in the spring and by the end of the year the contract was 26 percent complete.

In addition to the larger contracts enumerated, the Bureau had under way during the year construction work incidental to the major construction jobs. The work of completing the Hamilton Dam on the Colorado River in Texas was turned over to the Lower Colorado River Authority at the end of the year.

STATISTICAL DATA

The area irrigated in 1935 with water from Government works was 2,935,616 acres, an increase of 98,411 acres over that for 1934.

The area cropped was 2,861,136 acres, an increase of 104,438 acres.

The total value of crops was \$106,781,294, an increase of \$5,837,580 compared with 1934 and of \$22,589,561 compared with 1933.

Construction payments in cash and credits from power and other sources received during the fiscal year 1936 were \$399,372.09, a decrease of \$275,200 compared with the previous year.

Payments for operation and maintenance were \$996,115.12, a decrease from the previous year of \$82,780.92.

Total payments amounted to \$1,395,487.21 compared with \$1,753,468.13 in 1935, a decrease of \$357,980.92. Income to the reclamation fund from all sources during the fiscal year was \$4,838,211.47, or \$322,200.12 more than for the previous year.

The operation and maintenance expense for the year was \$1,204,053.44, an increase over the previous year of \$72,005.78.

Excess of operation and maintenance cost over receipts for the year amounted to \$207,938.32, compared with an excess of cost over receipts of \$53,151.62 for the previous year.

Construction work was carried on with funds provided under the National Industrial Recovery and Emergency Relief Acts. Operation and maintenance of the irrigation, drainage, and power systems was carried on with direct appropriations from the reclamation fund, money advanced by the water users organizations, and revenues from power operations.

The act of June 13, 1935, extended the provisions of previous acts granting temporary relief to water users on irrigation projects, and construction charges coming due for the year 1935 were not required to be paid. This explains the reason for the small payments as given under this heading.

CONTRACTS

During the past fiscal year the Bureau entered into a total of 4,455 contracts, their nature and the amounts involved being summarized as follows:

Nature of contract	Number of contracts	Amount involved
Cooperative investigations.....	2	\$103,000.00
Supplies.....	1,471	1,360,980.46
Material.....	1,016	10,762,802.86
Equipment.....	424	4,570,897.82
Miscellaneous services.....	267	142,850.18
Construction work.....	95	20,791,895.05
Land purchases, including improvements.....	242	475,718.26
Land sales, including improvements.....	4	1,900.00
Leases to the United States.....	78	78,289.06
Leases from the United States.....	299	66,060.55
Compromise of damages.....	1	12,000.00
Rental of Government equipment.....	5	376.00
Rental of water.....	261	96,513.59
Sale of surplus electrical energy.....	74	121,599.70
Sale of water rights to towns.....	1	1,370.00
Sale of water rights under the Warren Act.....	49	14,855.20
Sale of water rights within projects.....	6	25,120.82
Adjustment and relief.....	3	84,432.56
Transfer of project operations.....	1	-----
Miscellaneous.....	156	80,950.63
	4,455	138,791,612.74

¹ Estimated in part.

SETTLEMENT

Considerable activity was marked on the Federal reclamation projects. On the Vale and Owyhee projects, Oregon, about 1,000 acres were sold by the Vale-Owyhee Land Settlement Board, and in addition a number of tracts were disposed of by real-estate agents. On the Yakima project, Washington, numerous inquiries were received from the drought-stricken areas, and interest in valley lands increased perceptibly. Public land openings were held on the Shoshone (Wyoming), Belle Fourche (South Dakota), Sun River (Montana), Vale (Oregon), and Owyhee (Oregon-Idaho) projects. More than 10,000 acres were included in the tracts opened, and this acreage was divided into 170 farm units, averaging in size from 5 to 160 acres. The desire for land where irrigation assures productivity was evidenced by the large number of farmers filing application at these openings.

EMERGENCY CONSERVATION WORK

The drought of 1934 was responsible for the first allocation of C. C. C. camps to the Bureau of Reclamation for the purpose of improving the conservation of water supplies in the irrigated lands in the semiarid West. During that summer, an average of only three camps were so employed, which was increased to an average of nine camps during the summer of 1935. The fiscal year 1936 witnessed

the fourfold expansion to an average of 35 camps located on 23 reclamation projects in 14 western States.

Accomplishments by E. C. W. camps on the reclamation projects enhance the security of the United States in those projects and tend to assure the return of the money advanced by the Government for reclamation and associated developments. Regulated relief in distressed areas and conservation work of a highly beneficial nature in the protection and utilization of water supplies and natural resources are simultaneously provided through Emergency Conservation Work.

Major items of accomplishment completed to June 30 in the approximately 2 years since the first E. C. W. camps began field operations on the reclamation projects are as follows:

Earthwork for irrigation dams-----	cubic yards--	352,062
Clearing and cleaning of irrigation channels-----	square yards--	21,054,514
Clearing of irrigation reservoir areas-----	acres--	1,898
Concrete lining of irrigation canals-----	square yards--	145,474
Earth excavation for irrigation channels, canals, and ditches		
	cubic yards--	771,050
Irrigation water control structures, other than dams-----		2,076
Rodent control along canal banks and on irrigated lands----	acres--	509,500

GILA VALLEY PROJECT, ARIZONA

Actual construction of the Gila Valley project began June 1, 1936, under contract with Mittry Bros. Construction Co., which calls for 243,000 cubic yards of canal excavation and 92,500 cubic yards of tunnel excavation. Boyce & Igo, awarded a contract covering 3,200,000 cubic yards of canal excavation, were ready to start actual operations at the close of the fiscal year. These two contracts involve \$955,175 of the \$1,800,000 allocated from Emergency Relief funds. The construction of headworks and desilting basins are included in the contract with the Utah Construction Co., Winston Bros. Co., and Morrison-Knudsen Co., Inc., for construction of Imperial Dam. The total estimated cost of the first unit of the project is \$20,500,000. Designs are now being prepared for the Gila River siphon and other structures between Imperial Dam and the pumping plant near Blaisdell.

SALT RIVER PROJECT, ARIZONA

Gross returns from crops were \$18,639,000, which is \$2,000,000 more than last year, and nearly midway between the low yield of \$9,700,000 in 1932 and the high yield of \$26,000,000 in 1928. Crop receipts increased 12 percent, bank deposits 46 percent, and Phoenix building permits 300 percent over last year. Water supply is promising, and employment, wages, food and commodity prices have in-

creased. Water in storage June 30 was 694,000 acre-feet. Large quantities of pumped water are being used. The gross power revenue was \$50,000 over last year, but necessity to use more steam power made the net revenue \$50,000 less. Work is progressing on the \$6,000,000 Bureau program for building the Bartlett Dam on the Verde River and making improvements on the Salt River dams. Normal project operations are being carried out on a cash basis and work is in progress on the plan to refinance the bonded indebtedness.

ALL-AMERICAN CANAL PROJECT, ARIZONA-CALIFORNIA

The estimated cost of the All-American Canal system is \$38,500,000, of which \$20,150,000 had been allotted by the end of the fiscal year. Construction contracts awarded during the year totaled \$6,006,563.11. The largest of these was for the construction of Imperial Dam and desilting works at contract price of \$4,374,240.60. Canal excavation by Government forces was completed, 1,767,658 cubic yards of excavation having been moved during the year at a field cost of \$312,776.31. Of the entire 80 miles of All-American Canal now under construction, 45.5 miles have been completed, approximately 30,478,000 cubic yards of material excavated, and 11,300 cubic yards of concrete poured. A camp for Government employees was built near Imperial dam site. Other completed works include a 33,000-volt transmission line from the Siphon Drop power plant on the Yuma project to Imperial Dam and an oil-treated construction road from Laguna Dam to Imperial Dam. Excavation is in progress on the entire length of the canal. Designs and specifications for the many structures required along the canal line including bridges, crossings over the Alamo and New Rivers, Pilot Knob wasteway, checks, drops, turnouts, etc., are being prepared, and advertisement for these structures will be issued as rapidly as possible.

YUMA PROJECT, ARIZONA-CALIFORNIA

While crop values declined slightly during 1935, economic improvement was reflected by an increase exceeding 50 percent in local bank deposits. Values of livestock, motor vehicles, and farm equipment also showed substantial gains. Prices for farm commodities were in general remunerative and the year was a successful one for project farmers.

Three local cooperative marketing organizations were successfully engaged in marketing citrus, alfalfa (hay and seed), and cotton. Credit was available through six agencies, one of which is Federal, one cooperative, and four private.

Under terms of contract dated February 5, 1931, regarding advance payment of operation and maintenance, the Yuma County Water Users' Association had paid on July 1, 1936, some \$43,000 over the sum then due. Outstanding operation and maintenance charges at the close of June 30, 1936, on the reservation division and the auxiliary project were the lowest for a number of years.

BOULDER CANYON PROJECT, ARIZONA-NEVADA

Construction was completed for practically all the project's major features. The working forces were reduced gradually from 3,334 to 1,505.

Work was completed by Six Companies and was accepted by the Government on February 29. The Bureau took over the contractor's plant and equipment for use without charge until October 1 in the completion of plugs in tunnels 1, 2, and 3, switchyards, structures, and installation of powerhouse equipment.

The dam was practically completed, automatic elevators were installed in the Arizona and Nevada shafts, and installation of terrazzo floors in utility and elevator tower lobbies was in progress on June 30.

All work was completed on spillways and intake towers. Pouring of concrete anchors, piers, and thrust blocks was finished in all penstock headers, penstocks, and outlet tunnels. Excavation of the powerhouse highway tunnel adits to the stoney gates and the trail to the Arizona stoney gate was completed in October and placing of concrete lining was finished in May 1936. The first concrete for the downstream plugs in tunnels 2 and 3 was poured in the plug in tunnel 2 on August 21, 1935, and this plug was practically completed on June 30, 1936. Installation of emergency gates in the plug in tunnel 2 was in progress. Slide gates in the plug in tunnel 1 were permanently closed on May 1. In June, pouring of the remaining section of the plug in tunnel 1 was in progress. Construction of the canyon wall valve house and installation of gates and needle valves was completed. Elevators to the valve houses were installed by the contractors.

Construction of the powerhouse building and the Los Angeles switchyard was practically completed. Work was in progress on the Southern Sierras yard. The Arizona extension of the Black Canyon highway was finished and opened to traffic. Installation of power plant machinery by Government forces was in progress throughout the year.

On June 30 the turbine and relief valve scroll cases for unit N-1 were ready for concrete backfill; unit N-2, including lubrication system and governor system, was about 75 percent completed; unit

N-3 was being prepared for pressure test, and unit N-4 was ready for turbine runner installation. The turbine for unit A-8 was approximately 90 percent installed. Installation of the station service unit and penstock was practically completed.

The generator stator and housing for unit N-2 was set in place and installation of the split or parting coils in the stator was in progress. Erection of rotors for units N-1 to N-4, inclusive, and A-8 and stators for units N-1, N-3, and N-4 and A-8 was completed and ready for placing in final position. Installation of generator voltage oil circuit breakers in units N-1 to N-4, inclusive, and A-8, respectively, and the 23,000-volt bus structure at elevation 663 in units N-1 to N-4, inclusive, was completed. Erection of transformers was completed and the transformers were placed in permanent position. Installation of practically all of the control equipment was in progress.

The Babcock & Wilcox Co. completed erection of penstock and outlet plate-steel pipes. All systems except the upper Arizona penstock were successfully tested and preparations were under way at the end of the fiscal year to test this pipe.

At the end of the fiscal year the reservoir was approximately 95 miles long, contained 8,978,000 acre-feet of water, covered an area of approximately 62,450 acres, and its water surface elevation was 1,015.50, 120.5 feet above the lower gate sills of the intake towers. The flow at Grand Canyon was 26,300 cubic feet per second on June 30, and the outflow through the plug gates 11,600 cubic feet per second. On February 10, the lower cylindrical gate of the Arizona downstream intake tower was opened allowing the upper Arizona penstock system to be filled, after which the needle valve farthest downstream in the Arizona valve house was opened letting the first regular flow through the penstock system and canyon wall outlet works. The upper Arizona system was closed on June 10 and the upper Nevada system put in operation for the first time.

CENTRAL VALLEY PROJECT, CALIFORNIA

A project headquarters was established at Sacramento, in October 1935, followed by the location of divisional offices at Kennett, Friant, and Antioch. Cooperatively, the State water project authority is negotiating for water and rights-of-way contracts, and assisting in hydraulic studies, the General Land Office is making resurveys, and the United States Division of Investigations is appraising mining properties. On the Kennett division the Bureau has completed relocation surveys for 30 miles of railroad; surveys of four alternative dam sites—Kennett, Keswick, Baird, and Table Mountain. Exploratory work is 50 percent complete on Kennett dam site. Surveys

have been completed of Friant dam site, for Government camp sites, and for 37 miles of the two main canals. Exploratory work is 75 percent completed at Friant dam site. On the Contra Costa division, preliminary surveys for 30 miles of main canal have been completed.

ORLAND PROJECT, CALIFORNIA

The irrigated acreage in 1935 remained practically the same as for the two previous seasons but the per acre crop value, \$26.05, was \$7 less than for the year 1934. This loss was offset by the higher prices received for butterfat and whole milk. Since dairying is one of the project's major activities, there was a noticeable improvement in economic conditions as a whole. The supply of water was not only ample but there was a carry-over of 30,000 acre feet at the end of the season.

PARKER DAM PROJECT, CALIFORNIA

Parker Dam, under construction on the Colorado River with funds contributed by the Metropolitan Water District of Southern California, will serve as the diversion structure for the district's aqueduct. Work was resumed on October 15, 1935, following the approval on August 30, 1935, of the rivers and harbors bill. Work completed included the excavating and timbering of two 29-foot horseshoe shaped diversion tunnels in the Arizona abutment having a combined length of 3,465.92 feet, and the rough grading of the permanent access road to the dam on the California side. The construction contract as a whole was about 25 percent completed at the close of the fiscal year.

GRAND VALLEY PROJECT, COLORADO

In the 1935 season 16,185 acres were irrigated on 512 farms. The average crop value per acre was \$29.05, which was \$8.30 less than for the previous year, the decrease being attributed largely to the reduction in the price of beans. Beans and alfalfa were the principal crops, with smaller acreages of sugar beets, corn, oats, potatoes, tomatoes, and wheat.

The operation and maintenance charges were continued at \$1.40 per acre. The beet-sugar factory at Grand Junction was not operated on account of the small acreage. The Colorado Potato and Bean Growers' Association functioned well during the year, and handled a large part of these crops for project farmers.

The local farmers are working a gradual recovery from the depression. An ample supply of water was available from the Colorado River for all needs.

PINE RIVER PROJECT, COLORADO

This project is located in La Plata County in the southwestern part of Colorado in the San Juan Basin. It embraces about 56,000 acres of irrigable land and involves the construction of a storage reservoir of about 65,000 acre-feet capacity. The estimated cost of the project is about \$3,000,000.

An item of \$1,000,000 was included in the Interior Department appropriation bill approved June 22, 1936, for commencing construction of the project.

UNCOMPAHGRE PROJECT, COLORADO

During the irrigation season of 1935, 1,609 farms were irrigated, 770 by owners, and the average crop value was \$23.39 an acre, an increase of \$1.45 per acre over the previous year. The sugar factory at Delta handled all beets raised on the project, and most of the potatoes and onions were marketed through cooperatives. Three cooperative gasoline stations did a thriving business. The \$325,000 rehabilitation program started in October 1934, involving repairs to or replacement of canal lining and replacement of numerous canal structures, was prosecuted with a large force during the winter. The program will be completed early in 1937.

Taylor Park Dam and Reservoir is being constructed on the Taylor River, 32 miles northeast of Gunnison, Colo. When completed the reservoir will store 106,230 acre-feet of water to supplement the natural flow rights of the project water users from the Gunnison River.

BOISE PROJECT, IDAHO

Under an allotment of \$600,000 by the Emergency Relief Administration, contract was let in January for raising Arrowrock storage dam and repairing downstream face and spillway. Work was retarded in the spring by a high flood discharge in the river, but it was well under way at the end of the year. The distribution system of the Arrowrock division was in charge of the water users' board of control and the Government controlled the storage and diversion works and power plant. Crop yields and values showed a material increase over the preceding year on account of a less deficient water supply and the choice of new and more profitable crops. The division is fully settled. With an Emergency Relief Administration allotment of \$1,000,000 construction of the Black Canyon Canal for the Payette division was begun. Four tunnels were under construction and additional tunnels, canals, and other structures were ready for advertisement. Settlement of the Payette division lands will be delayed until the main canal is completed.

Operation and maintenance of the Deadwood Reservoir and Black Canyon Dam, power plant, and pumping plant was carried on by Government forces.

MINIDOKA PROJECT, IDAHO

The total value of crops grown in 1935 was \$2,851,268. On the gravity division 1,560 farms were irrigated and 854 on the pumping division. About 60 percent of the farms were operated by owners and 40 percent by tenants. Operation and maintenance charges on both gravity and pumping divisions were well paid up. Construction charges on the pumping division were again paid out of power profits, while on the gravity division most of the settlers took advantage of the moratorium permitting a postponement of one-half their construction charges.

There was a heavy snowfall over the Upper Snake River drainage area during the winter 1935-36 with a resultant abundant run-off. Both Jackson Lake and American Falls Reservoirs were filled in the spring of 1936 with a spill of some 620,000 acre-feet from American Falls and 130,000 acre-feet from Jackson Lake. More than 713,000 acre-feet were diverted on the project in 1935, or an average of about 7 acre-feet per acre.

UPPER SNAKE RIVER PROJECT, IDAHO

Actual construction of Island Park Dam began on October 28, but because of severe winter conditions little was accomplished until spring. At the end of the fiscal year the work was 11 percent completed. Diamond drilling and test pits were completed for the Grassy Lake Dam. Plans and specifications were being prepared at the end of the year. Final location was made of the cross cut canal and diversion dam across Henrys Fork. These are necessary to make water stored in Island Park Reservoir available to canals in the district which take water out of the Teton River. Bids for this work were opened on June 25. Investigations were in progress to determine the feasibility of a small reservoir at Squirrel Meadows.

BITTER ROOT PROJECT, MONTANA

The Bitter Root project has 26,191.34 acres of irrigable land of which an area of 16,000 is being farmed. There are 325 families, making a project population of about 1,250 people. To supplement the present storage water supply a feeder canal seven miles long and designed to carry 100 second feet was constructed from an adjoining watershed. Five thousand acre-feet were delivered to the main canal from this source.

FRENCHTOWN PROJECT, MONTANA

There are 36 farms in the district with an average of 140 acres per farm. Some of the larger farms will be subdivided and sold to new settlers. The project lands are being dry farmed. The principal crops are small grains, which are in good condition. The work included location surveys for the main canal and lateral system, construction of 17 miles of main canal, and construction of 105 minor main canal structures. Work was started on the main canal, diversion dam, and also on the laterals. All contract work on the project will be completed by October 31, 1936 and the system will be ready for the 1937 irrigation season.

HUNTLEY PROJECT, MONTANA

A total of 651 farms were operated in 1935, 348 by owners and 303 by tenants.

The Wool Growers' Association is active and markets practically all of the lambs and wool grown on the project. During the past year 36,000 pounds of wool and 3,000 lambs were marketed. Work on the Anita reservoir dam, a small storage unit, with a maximum height of 45 feet and a storage capacity of 450 acre-feet, will be completed during the present year. Other construction consisted of work on jetties, straightening the river channel, and building a 400-foot cribbed wing dam.

MILK RIVER PROJECT, MONTANA

Construction in progress consisted in the renewal in kind with concrete of 60 original timber structures in the Malta and Glasgow divisions and the completion of repairs on St. Mary canal. Operation and maintenance of the entire system was carried on by Government forces with funds advanced by the districts. The demand for water was heavy but no shortage occurred. The area irrigated exceeded that of any previous year. Although the 1936 irrigation season was dry and the demand for water exceeded the supply, crops were fair and good prices were anticipated. Investigations of the proposed Fresno dam site were completed.

SUN RIVER PROJECT, MONTANA

The crop program followed since 1929 of changing the large grain acreage to alfalfa, sweetclover, forage, and cultivated crops was continued during 1935 and early 1936. Good progress was made with 7,500 acres of seed peas and a general increase in soil-building crops. The water supply continued good. The weather was un-

usually dry and windy. The planting of shelterbelts and control of noxious weeds continued. The Fort Shaw and Greenfields irrigation districts continued to operate the completed work successfully. Progress on extensions to lateral system, drainage, and canal improvements was made with N. I. R. A. and E. R. A. funds. Eighteen miles of drain were completed; Pishkun Canal and 10 miles of Sun River slope canal were greatly improved. Fifty-five miles of laterals and structures on the East Greenfields bench under contract were about 70 percent complete. Contract on Mill Coulee wasteway and 3 miles of laterals northwest of Fairfield, and 15 miles of lateral Sun River slope division were about 50 percent complete.

LOWER YELLOWSTONE PROJECT, MONTANA-NORTH DAKOTA

The lower Yellowstone project, which is being operated and maintained by the board of control under district contracts with the Bureau, is situated on the west side of the Yellowstone River in eastern Montana and western North Dakota. April 20 to October 10 is the maximum period of water deliveries. Irrigated farms on the project numbered 524. The irrigated area was 38,638 acres which exceeds the previous year by 2,190 acres. During the current year 59 percent of the irrigated farms were operated by owners or managers and 41 percent by tenants. There is a gradual trend toward farm ownership.

NORTH PLATTE PROJECT, NEBRASKA-WYOMING

The reserved works features of the project, comprising the Pathfinder and Guernsey Reservoirs, Whalen diversion dam, distribution and power systems, were operated and maintained by the Bureau. The canal, lateral, and drainage systems were operated and maintained by the four project irrigation districts. Reserved works features were operated without unusual difficulties or expenditures. Tentative plans for water conservation under consideration by district officials constitute the most important future need of the project. Of the total irrigable area comprising 235,000 acres, 90 percent was in cultivation and 82 percent cropped or pastured. The number of farms irrigated was 2,756. Crop yields were normal and the economic condition of farmers showed further improvement in spite of lower prices for hay and grain. The available water supply was about 1.1 acre-feet at farmers' headgates. On account of spring rains, this irrigation supply was adequate to mature most crops. For the 1936 season the water supply will be 1.2 acre-feet. Spring rains were below normal, however, and less water will be available for late season use than was available last year.

HUMBOLDT PROJECT, NEVADA

The contract for the construction of the Rye Patch Dam was completed June 1, 1936. All transactions for the purchase of lands and water rights in the Battle Mountain area were completed during the year. Dragline operations began on swamp drainage and river channel improvements. The 1935 water supply amounted to 25 percent of decreed rights, which seriously curtailed production. The 1936 water supply will fully supply the decreed rights owing to the beneficial regulatory effects of the Rye Patch Dam, and it is estimated that 10,000 acre-feet of storage will be carried over to 1937.

NEWLANDS PROJECT, NEVADA

During the fall of 1935 and the spring of 1936, heavy storms in the Sierra Nevada Mountains supplied water sufficient to fill Lahontan Reservoir and raise Lake Tahoe to an elevation of 6,225.90 feet, the highest since 1928. This storage gave the Newlands project a sufficient water supply for the season, the results above average in crops of alfalfa hay and grains. Much beneficial work was accomplished with the aid of two E. C. W. camps located on the project. This work consisted of replacement of worn-out structures, construction of new structures, lining of laterals, rock and brush riprap, strengthening of canal banks, clearing growth from water channels, etc.

TRUCKEE RIVER STORAGE PROJECT, NEVADA

Topographic, test pit, and diamond drill explorations of the two possible dam sites at Boca and geological studies were completed during the year. Negotiations were under way for right-of-way. The electors of the district at the election of April 7, 1936, ratified the repayment contract and the Truckee River agreement. The Truckee-Carson irrigation district also ratified the Truckee River agreement at the election. The project received a 70 percent water supply during 1935 owing to deficient natural flow and low stage of Lake Tahoe. A full water supply is assured for the 1936 season because of the 3.67-foot recovery of Lake Tahoe.

CARLSBAD PROJECT, NEW MEXICO

Extension of the east embankment of Lake McMillan by E. C. W. forces was completed in August 1935. Work at Lake Avalon, which included raising the dam 6 feet by earth fill protected by rock masonry and additional protection of all spillway channels by rock riprap, was completed in June 1936. A contract was negotiated with the Carlsbad irrigation district December 3, 1935, for the expenditure

of not to exceed \$2,500,000, to build Alamogordo Dam and line with concrete a portion of the canal and lateral system. Construction of the dam was authorized and contract awarded to the Hallett Construction Co. of Crosby, Minn., on January 25, 1936, for \$1,132,547. The crop season of 1935 was characterized by an ample water supply and good yields and prices for the principal crops. Economic conditions were generally good. Construction will be continued at Alamogordo Dam and plans are being completed for concrete lining.

RIO GRANDE PROJECT, NEW MEXICO-TEXAS

The distribution system will now serve more than 156,000 acres. Construction work during the past year consisted in the reconstruction or reconditioning of the main trunk drain in the Mesilla Valley, and the enlarging of several culverts, bridges, and flumes. Irrigation requirements necessitated the operation and maintenance of the entire distribution system, but because of the local financial condition it is not possible to properly maintain the drainage system. The total cost of the project operation and maintenance was \$323,017 as compared with \$370,000 in 1930 when all desirable maintenance work was performed. The water users in general at this time are in good financial condition.

UMATILLA PROJECT, OREGON

The operation of the east and west divisions of the Umatilla project were continued under the respective irrigation district organizations, the combined irrigated area of the two divisions being approximately 12,000 acres. On the east division the economic situation was better at the close of the year than at any time since 1929. Poultry is rapidly becoming the major industry on this project as it has been demonstrated that turkeys and eggs can be produced as reasonably as at any other point in the Northwest, a condition which is due largely to the cooperative organizations' efforts in both marketing and providing cheap feeds.

VALE PROJECT, OREGON

Beginning 1934 the project was operated by Government forces for the Vale Oregon irrigation district, financed by collections from 309 water users. Nearly all lands for which water is available have been settled. Crops were diversified, alfalfa being the principal crop. Cooperative organizations in the older adjoining sections handled most of the produce. The Vale-Owyhee Land Settlement Association operated with Nyssa, Oreg., as headquarters. Construction of the Agency Valley Dam was completed by the contractors

December 13, 1935. Construction of Willow Creek laterals, consisting mostly of excavation, was started October 8, 1935, by C. C. C. forces.

KLAMATH PROJECT, OREGON-CALIFORNIA

In Tule Lake division work on the extension of the distribution and drainage systems was resumed and the enlarging and strengthening of dikes was completed. Enlargement and extension of the drainage system in the Klamath irrigation district was completed. The farm income for 1935 was about the same as for the previous year. Crops were universally good, and commodity prices satisfactory. A number of potato growers experienced heavy losses owing to early October freezes and below-zero temperature on November 2. The outlook for 1936 is excellent, with an abundant water supply. All crops are average or better, and indications are that farm income will be the greatest on record. An amendatory contract, providing for the suspension of charges on certain lands, was executed by the Langell Valley irrigation district.

OWYHEE PROJECT, OREGON-IDAHO

Construction of irrigation works is 89 percent complete. Storage and canal systems and laterals in Mitchell Butte division are practically completed and laterals in Dead Ox Flat division are 25 percent complete. Pumping plants for Advancement irrigation district were completed and there remain the enlargement of the Payette-Oregon Slope and Ontario-Nyssa pumping plants and rehabilitation of Gem plant to complete this feature. Four drains have been completed in the old districts. Some work remains to complete a number of minor features.

Delivery was made of a full irrigation supply to Advancement and Kingman districts and to about 6,400 acres of new lands, and of a partial gravity supply to Ontario-Nyssa and Gem districts. The latter released sufficient Black Canyon power to provide the remaining pumping districts with a full supply of power for pumping. Repairs were made and puddling and priming and riprapping of canals and laterals were carried on.

BELLE FOURCHE PROJECT, SOUTH DAKOTA

No construction in progress other than replacement of wood structures with concrete as a maintenance feature and miscellaneous betterments under the E. C. W. program camp BR-2. A slight water shortage occurred in 1935, but production was fairly satisfactory

and crops had a total value of \$1,000,000. Severe drought persisted throughout the fiscal year and with the reservoir only 42 percent full, the supply was entirely inadequate for 1936. Twenty-eight percent of the project farms are occupied by owners, 33 percent by tenants, and 39 percent have no resident operators, although the latter are mostly in production under rental.

COLORADO RIVER PROJECT, TEXAS

Under contracts with the Lower Colorado River Authority, the Bureau is constructing this project at an estimated cost of \$20,000,000. Rehabilitation of camp at Hamilton Dam was begun October 7, 1935. On March 17, 1936, actual construction was begun, and excavation and drilling of grout holes was started. On May 18 the first concrete was placed in the dam by the Bureau. Awards were made for reservoir clearing and for construction of the North dike. Bids were opened for the construction of Arnold Dam and the production of concrete aggregates for both dams, but no awards were made. On July 1 in accordance with a revised contract dated June 11 all work on the two dams was turned over to the Authority. Future work will cover the construction of the Marshall Fork flood-control dam above Austin, Tex.

HYRUM PROJECT, UTAH

The purpose of the Hyrum project is to provide a supplemental water supply for lands in the vicinity of Hyrum, Wellsville, and Mendon, Utah, in the southern part of the Cache Valley. Hyrum Reservoir was practically completed in August 1935, and the canal system was finished in the spring of 1936. Operation and maintenance was turned over to the South Cache Water Users' Association May 1, 1936. The parapet walls along the road on the top of the dam will be constructed in the fall of 1936, which will complete the construction of the project as planned.

MOON LAKE PROJECT, UTAH

Work was continued on the Moon Lake Dam. The outlet tunnel, stripping of the foundation for the dam, and the excavation of the cut-off trench are about completed. Construction of the Duchesne feeder canal, Midview Dam, and Midview lateral is progressing. These latter features are being constructed with the use of an E. C. W. camp aided by expenditures of project funds. Final surveys are being made on the Yellowstone feeder canal. A supplemental water supply consisting of 40,000 acre-feet of storage and some natural

flow for the irrigation of 65,000 acres of land under existing canal systems will be provided. The estimated cost of the project is \$1,500,000.

OGDEN RIVER PROJECT, UTAH

The purpose of the project is to supply a much needed supplemental water supply for lands already largely in a high state of cultivation. Construction of the project, begun in fiscal year 1935, was continued throughout fiscal year 1936, work being done on Pine View Dam and appurtenant works, the Ogden Canyon conduit, the Ogden-Brigham canal, and the South Highline canal. The project was about 64 percent completed at the end of the fiscal year. It is planned to continue and probably finish the construction of the project during fiscal year 1937.

PROVO RIVER PROJECT, UTAH

A repayment contract was executed by the Provo River Water Users' Association for the construction of the Deer Creek division, which includes the construction of the Deer Creek Reservoir on Provo River, the enlargement of the Weber-Provo diversion and Provo River canal, and the construction of the Duchesne tunnel. The Deer Creek Reservoir will have a capacity of 150,000 acre-feet. A supplemental water supply will be provided for 40,000 acres of highly developed lands and also for two or three metropolitan districts in Utah and Salt Lake Counties. The estimated cost of the division is \$7,600,000. A second division includes the construction of a dike across Utah Lake and the revision and deepening of the Jordan River outlet from the lake.

SANPETE PROJECT, UTAH

Construction work was started on the Ephraim tunnel by the contractor September 30, 1935. By the end of the fiscal year, 2,000 feet of the total of 7,200 feet were excavated. The two feeder canals leading to the tunnel were completed in November 1935. A second division of the project will include the construction of the Spring City tunnel 5,000 feet long with short feeder canals leading thereto. This tunnel was advertised for construction in 1935, but bids were rejected. It is expected the tunnel will be readvertised in the late summer season of 1936.

STRAWBERRY VALLEY PROJECT, UTAH

The principal construction work during the fiscal year consisted in the continuation of operations on the Currant Creek feeder canal.

When completed this feature will augment the project water supply by picking up the run-off from some 8 square miles which formerly was not a part of the Strawberry watershed. A proposed addition to the power system is pending. A low-head installation is contemplated just below the existing project plant. Steady increase in the firm power load makes the new development imperative within the near future. The greatest resettlement need is the removal of farmers from marginal tracts to the more productive farm units.

WEBER RIVER PROJECT, UTAH

The Echo Reservoir, which was constructed on the Weber River, 1929-31, was filled to its capacity of 74,000 acre-feet in 1935. In providing a supplemental supply for 70,000 acres of highly developed lands in Ogden and Weber Valleys and 15,000 acres in Provo Valley, the reservoir was directly responsible for the largest crop production in the history of the areas.

COLUMBIA BASIN PROJECT, WASHINGTON

An allotment of \$20,250,000 was made under the Emergency Relief Act, to continue work on the project. Of this amount, \$20,000,000 was for construction of the Grand Coulee Dam, power plant, and appurtenant works, such as the Government camp, construction railroad, highway, bridge, reservoir surveys, and purchase of lands for right-of-way. The \$250,000 allotment was provided for the preparation of topographic and land ownership maps and a classification of lands to be irrigated under the project. Construction of the dam and power plant was continued under a modified contract altering the plans and providing for the construction of foundations for a dam which will eventually extend to a spillway crest at elevation 1,260. The estimated value of the revised contract amounts to \$36,869,150. Major items of work under the contract include diversion and care of the river, excavation for dam and power-house, amounting to approximately 16,000,000 cubic yards, and the placing of 4,500,000 cubic yards of concrete.

At the close of the fiscal year the contractor had excavated 13,840,000 cubic yards and placed 710,840 cubic yards of concrete. Cofferdams enclose areas on both east and west sides of the river. Construction of cross-river cofferdams will be commenced in the near future. The contractor's construction plant includes a 60-inch belt conveyor, a sand and gravel plant, two concrete mixing plants having a combined capacity of 14,000 cubic yards of concrete per 24-hour day, and cement storage silos. Contracts were completed during the

fiscal year covering the construction of buildings and street improvements in Government camp and erection of a highway bridge. Buildings include 77 residences, 2 dormitories, school, garage, fire station, warehouse, administration building, and 61 temporary buildings. Under the project for economic surveys, work was started October 15, 1935, with headquarters at Ephrata, Wash. About 100 men are engaged on section line retracement and topographic surveys on Columbia Basin irrigable lands. At the end of the fiscal year 46,225 acres had been mapped.

OKANOGAN PROJECT, WASHINGTON

In the spring of 1936, 785 feet of 3-inch lining were placed in the main canal, and 3,250 feet of worn-out pipe line were replaced. There still remain some 25,000 feet of pipe line, miscellaneous sizes, to be replaced. The gravity system of the project furnished "New" right lands with $2\frac{1}{2}$ acre-feet of water during 1935. The final estimate for 1936 is 2 feet per acre. In 1935 there was a small increase in irrigated acreage on the project, which irrigated acreage will probably be unchanged in 1936.

YAKIMA PROJECT, WASHINGTON

Sunnyside and Tieton divisions.—Irrigated areas remain practically unchanged. Average per acre crop values for 1935 were \$39.51 for the Sunnyside and \$105.49 for the Tieton division. Livestock value increased.

Kittitas division.—An area of 56,481 acres was irrigated, an increase of 8.5 percent over 1934. The average per acre crop value was \$24.27, an increase of 28 percent. There was a substantial increase in the number of horses and cattle and in the value of livestock.

Kennewick division.—The net acreage cropped was 2,072, and the average per acre value \$54.99.

Storage division.—An ample supply of storage was available. A parapet wall and auxiliary air duct were constructed at Cle Elum Dam. Construction of the Kachess Dam spillway was begun in May 1936. Clearing operations by E. C. W. camps at Clear Creek and Kachess Reservoirs were in progress.

Rosa division.—Actual construction of this division, a \$15,000,000 project, to irrigate 72,000 acres, was started on January 28, 1936. The work involves the construction of a diversion dam, power and pumping plants, transmission lines, drainage ditches, 100 miles of main canal, tunnels, siphons, and about 500 miles of laterals. A repayment contract dated December 13, 1935, was obtained from the

Yakima-Benton irrigation district. At the close of June 1936, contracts had been awarded and work was in progress on 18,000 feet of 7-foot diameter horseshoe-type tunnel and 5 miles of open canal of 2,200 cubic feet per second capacity. Contracts for the construction of the diversion dam, Yakima River siphon, and 2 miles of additional canal will be let during the fiscal year 1937.

CASPER-ALCOVA PROJECT, WYOMING

Construction was continued with National Industrial Recovery and Emergency Relief allotments. Lining of tunnel no. 2, Casper canal, was completed by contract, bringing the canal to station 190. Contracts were awarded for construction of permanent buildings at Seminoe and Alcova dam sites, Seminoe and Alcova Dams, and four tunnels of the Casper canal. Construction was commenced, by contract, on the two dams and tunnels 5 and 6, and by Government forces, on the sewer, water, and light system for the permanent camp at Seminoe dam site, and on the excavation of the Casper canal from station 190 to 3,138. Construction will be commenced, by Government forces, on Casper canal structures and the lateral system for the first unit of the project. A contract was entered into, during the year, with the Casper-Alcova irrigation district for repayment of irrigation system construction costs, with a maximum liability of \$3,080,000.

RIVERTON PROJECT, WYOMING

In 1935, with an ample water supply, there was a marked improvement in crop yields per acre, though crop values were less. In 1936 there is an increase of 25 percent in the number of settlers and the irrigated area with prospect of further substantial increase in 1937. Few settlers are leaving the project. Practically all settlers have paid the water rental charges. The outlook for crops is favorable. Better transportation facilities are needed. Contract for the construction of Bull Lake Dam was let, and the construction work was well under way. Maintenance work was unusually heavy.

SHOSHONE PROJECT, WYOMING

In 1935, 956 farms were irrigated and the supply of irrigation water was ample. Settlement of the Willwood division is practically complete. Nine farm units have not yet been opened to entry. Construction work was started on the Heart Mountain canal system. A contract was made for the construction of tunnels 1, 2, and 3, Shoshone Canyon conduit, and good progress was made by the con-

tractor. Ten miles of canal and 7,000 feet of structure sites were located by Government forces. On the Willwood division 4.3 miles of drain were constructed by Government forces.

SECONDARY INVESTIGATIONS

Investigations of proposed projects were carried out at a total cost of \$264,000, mainly with funds allotted under the National Industrial Recovery Act of June 16, 1933, or advanced by local interests. Principal among these were:

ARIZONA-CALIFORNIA

Silt surveys of the Colorado River were continued.

COLORADO

Survey of the Colorado-Big Thompson transmountain diversion was continued; and survey of the Blue River-South Platte transmountain diversion and investigation of a number of storage sites on the western slope were begun.

COLORADO-NEW MEXICO

Survey and investigation of a number of dam and reservoir sites in the Rio Grande Basin were in progress, including those of Wagon Wheel Gap, Vega-Sylvestre, and Conejos sites.

IDAHO

Survey of reservoir sites in the Boise-Weiser-Payette drainage area was commenced in November and the investigation of reservoir sites on the Upper Snake River was completed.

MONTANA

Investigation of the Buffalo Rapids project was completed and a report made in August 1935. Surveys are in progress of the proposed Gallatin River project.

MONTANA-IDAHO

The survey of the Madison River diversion project was continued and a progress report issued in November 1935.

NEBRASKA

A survey of the irrigation possibilities along the lower Platte River was continued together with study of the electric power market.

NEVADA

A report on irrigation of lands in southern Nevada by utilization of power from Boulder Dam was made.

OREGON

Extensive surveys and investigation of the Deschutes project were made and a progress report submitted in July. A survey of the Grande Ronde project was also made and progress report made in October.

SOUTH DAKOTA

Investigation of irrigation possibilities in the Black Hills in the vicinity of Rapid City was in progress.

UTAH

Surveys of projects in the Salt Lake Basin were continued, including the Dixie and Gooseberry projects, and investigation of an aqueduct for the Salt Lake City Metropolitan District.

COLORADO RIVER BASIN

Topographic mapping and land classification of large areas in the Colorado River Basin under section 15 of the Boulder Canyon Project Act were continued.

HAWAII

Surveys were commenced of irrigation possibilities on the island of Molokai.

TABLES

RECLAMATION TABLE 1.—*Consolidated financial statement, June 30, 1936*

DEBIT SIDE

Construction account:

Primary projects:

Cost of irrigation works:

Original construction.....	\$247,263,236.68
Supplemental construction.....	12,667,321.06
Value of works taken over.....	2,056,939.90

Total construction cost..... \$261,987,497.64

Operation and maintenance prior to public notice,
net..... \$2,813,958.94

Operation and maintenance deficits and arrear-
ages funded with construction..... 5,404,793.82

Penalties on water-right charges funded with con-
struction..... 1,804,536.15

10,023,288.91

Total..... 272,010,786.55

Less income items:

Construction revenues..... \$7,015,063.03

Contributed funds..... 1,777,257.33

Nonreimbursable appropriation, Rio Grande

Dam..... 1,000,000.00

9,792,320.36

262,218,466.19

Less abandoned works, nonreimbursable cost,
and charge-offs..... 17,110,064.60

Balance payable..... \$245,108,401.59

Yuma auxiliary project:

Cost of irrigation works..... \$902,837.00

Impounded funds, economy acts..... 504.96

\$903,341.96

Less construction revenues..... 1,085.47

902,256.49

Palo Verde flood protection cost of reconstruction and repairs..... 48,806.46

Tennessee Valley Authority:

Cost of designs..... \$484,911.25

Less contributed funds..... 484,911.25

Secondary projects and general investigations:

Cost of surveys and investigations..... 3,601,198.66

Less contributed funds..... 657,988.57

2,943,210.09

General offices' expense undistributed.....

775,644.21

Plant and equipment.....

1,163,259.92

Materials and supplies.....

2,166,046.93

Accounts receivable:

Current accounts..... \$1,089,811.43

Deferred accounts..... 177,957,185.13

179,046,996.56

Undistributed clearing cost accounts.....

131,513.16

Unadjusted debits, disbursement vouchers in transit.....

51,961.99

Cash:

Balance on hand:

Reclamation fund..... \$10,999,261.08

Special funds..... 55,834.78

National Industrial Recovery allotments..... 17,824,436.00

Emergency Relief allotments..... 36,451,372.69

Funds transferred from other departments..... 1,515,769.26

Contributed funds..... 16,416.73

\$66,863,090.54

In special deposit and in transit.....

31,488.08

66,894,578.62

Total debits..... 499,232,676.02

RECLAMATION TABLE 1.—*Accretions to reclamation fund, by States—Continued*

CREDIT SIDE

Security for repayment of cost of irrigation works:	
Contracted construction repayments.....	\$221,813,639.71
Yuma auxiliary contracted repayments.....	596,815.38
	<hr/>
	\$222,410,455.09
Current accounts payable.....	5,471,500.74
Deferred and contingent obligations.....	1,529,687.38
Reserves and undistributed profits.....	8,189,131.11
Operation and maintenance results, surplus.....	613,950.03
Unadjusted credits, collection vouchers in transit.....	1.47
Government aid for reclamation of arid lands:	
Reclamation fund.....	\$162,556,801.54
Advances to reclamation fund:	
Treasury loan (act of June 25, 1910).....	\$20,000,000.00
Less amount repaid.....	10,000,000.00
	<hr/>
	10,000,000.00
Treasury loan (act of Mar. 4, 1931).....	5,000,000.00
	<hr/>
	15,000,000.00
National Industrial Recovery allotments.....	47,371,000.00
Emergency Relief allotments.....	50,520,000.00
Funds transferred from other departments.....	1,569,100.00
Special funds:	
Increase of compensation.....	2,797,960.33
Rio Grande Dam.....	1,000,000.00
Wind River Indian, Riverton.....	359,176.04
Judgments, United States courts.....	602,814.38
Drainage and cut-over lands.....	99,815.08
General investigations, 1923 to Dec. 31, 1924.....	266,352.66
Arid, semiarid, swamp, and cut-over timberlands.....	35,923.75
Columbia Basin irrigation project.....	11,634.28
Colorado River levee system.....	495,110.59
Palo Verde flood protection.....	48,806.46
Claims for damages, act of Dec. 28, 1922.....	239.23
	<hr/>
	282,734,734.34
Less nonreimbursable appropriation, Rio Grande Dam.....	1,000,000.00
	<hr/>
	281,734,734.34
Less impairment of funds:	
Abandoned works.....	\$2,833,484.62
Nonreimbursable construction cost.....	822,921.59
Operation and maintenance cost uncollectible.....	453,272.39
Charge-offs, act of May 25, 1926.....	14,651,474.08
Washington office cost since Dec. 5, 1924.....	1,682,560.83
Attendance at meetings.....	1,815.90
Giving information to settlers, cost.....	7,852.46
Prepaid civil-service retirement fund.....	2,340.33
Returned to Treasury, miscellaneous receipts.....	11.91
	<hr/>
	20,455,734.11
	<hr/>
	261,279,000.23
Less impounded funds, economy acts, reclamation fund.....	261,047.09
	<hr/>
	261,017,953.14
Total credits.....	
	<hr/>
	499,232,676.02

1 Contra.

RECLAMATION TABLE 2.—*Available funds, expenditures, and balances, fiscal year 1936*

Items	Funds						
	Reclamation	Yuma auxiliary	Colorado River levee system	Palo Verde flood protection	National Industrial Recovery Act	Emergency Relief allotments	Transfers from other agencies
Balance on hand July 1, 1935.....	\$7,683,224.41	\$143,406.09	\$36,604.91	\$562.97	\$38,791,461.46	-----	\$45,181.07
Receipts:							
Proceeds from sale of public lands.....	154,567.65	-----	-----	-----	-----	-----	-----
Proceeds from Oil Leasing Act.....	2,053,152.48	-----	-----	-----	-----	-----	-----
Proceeds from potassium royalties.....	79,873.55	-----	-----	-----	-----	-----	-----
Proceeds from Federal power licenses.....	86,831.87	-----	-----	-----	-----	-----	-----
From project collections.....	2,321,417.58	-----	2,522.59	-----	113,211.25	\$42,115.87	7,447.64
Contributed funds.....	-----	-----	-----	-----	-----	-----	16,700.00
Transfer, act of May 9, 1935.....	142,368.34	—142,368.34	50,000.00	1 562.97	1 10,080,000.00	50,520,000.00	-----
Appropriations and allotments from general fund.....	-----	-----	-----	-----	-----	-----	-----
Total.....	12,521,435.38	1,037.75	89,127.50	-----	28,824,672.71	50,562,115.87	43,610.87
Expenditures:							
Disbursements.....	1,522,174.80	1,037.75	33,292.72	-----	11,000,236.71	14,110,743.18	205,959.45
Balance on hand July 1, 1936.....	10,999,261.08	-----	55,834.78	-----	17,824,436.00	36,451,372.69	1,515,769.26
							27,194.14
							16,416.73

1 Contra. Reversion to General Treasury.

RECLAMATION TABLE 3.—*Accretions to reclamation fund, by States*

States	Sale of public lands		Proceeds from oil leasing act		Total to June 30, 1936
	Fiscal year 1936	To June 30, 1936	Fiscal year 1936	To June 30, 1936	
Alabama.....			\$4,021.80	\$178,871.43	\$178,871.43
Arizona.....	\$14,943.87	\$2,674,521.22		159.86	2,674,681.08
California.....	18,266.65	8,170,201.09	1,072,287.21	12,357,464.51	20,527,665.60
Colorado.....	12,411.35	10,263,309.20	61,731.45	558,924.16	10,822,233.36
Idaho.....	8,448.91	7,065,907.65	2,050.77	17,447.06	7,023,354.71
Kansas.....		1,033,058.76			1,033,058.76
Louisiana.....			3,252.93	42,311.24	42,311.24
Montana.....	21,664.97	15,328,256.57	49,312.02	1,145,367.69	16,473,624.26
Nebraska.....		2,094,196.82			2,094,196.82
Nevada.....	987.32	1,022,417.19	252.00	5,363.37	1,027,780.56
New Mexico.....	27,966.48	6,636,842.72	166,727.06	695,628.71	7,332,471.43
North Dakota.....	348.26	12,218,094.34	11,606.85	137,705.49	12,355,799.83
Oklahoma.....		5,929,061.55			5,929,061.55
Oregon.....	5,887.72	11,963,388.64		10.28	11,963,398.92
South Dakota.....	1,962.03	7,730,106.50	125.23	1,636.59	7,731,743.09
Utah.....	7,426.70	4,231,029.34	48,190.95	465,581.41	4,696,610.75
Washington.....	2,262.35	7,445,740.13		33,749.63	7,479,489.76
Wyoming.....	31,991.04	8,620,640.02	633,594.21	33,548,244.17	42,168,884.19
Total.....	154,567.65	112,366,771.74	2,053,152.48	49,188,465.60	161,555,237.34
Proceeds, Federal water power licenses.....					¹ 740,332.54
Proceeds, potassium royalties and rentals.....					² 261,231.66
Grand total.....					162,556,801.54

¹ Proceeds for fiscal year, \$86,831.87.² Proceeds for fiscal year, \$79,873.55.

RECLAMATION TABLE 5.—*Accounts receivable, construction water-right charges*

State and project	Due		Collected			Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash		Other cred- its to June 30, 1936	
			Fiscal year 1936	To June 30, 1936		
Arizona:						
Salt River.....	\$152,490.30	\$6,811,234.71	\$152,490.30	\$6,811,234.71		
Yuma auxiliary.....	¹ 6,420.37	588,799.71	¹ 5,274.97	585,248.04	\$1,672.80	\$1,878.87
Arizona-California: Yuma.....	20,529.37	3,834,783.11	¹ 4,736.87	3,270,265.11	562,394.46	2,123.54
California: Orland.....	3,506.88	822,750.84	5,380.71	779,195.81		43,555.03
Colorado:						
Grand Valley.....	10,897.60	170,080.89		80,729.94	89,350.95	
Uncompahgre.....	146.71	490,269.48	34.71	427,282.43	62,987.05	
Idaho:						
Boise.....	¹ 4,456.24	4,011,585.48	¹ 4,456.24	3,984,392.19	27,193.29	
Minidoka.....	103,696.16	8,108,304.02	25,538.76	7,246,747.91	839,038.87	22,517.24
Montana:						
Huntley.....	1,703.78	560,839.96	659.41	468,082.31	92,674.85	82.80
Milk River.....	¹ 5,095.20	71,667.56		3,002.76		68,664.80
Sun River.....	1,509.09	220,419.55	274.18	206,497.82	13,252.69	669.04
Montana - North Dakota:						
Lower Yellowstone.....	1,603.03	293,760.98	1,305.80	292,796.30	964.68	
Nebraska-Wyoming: North Platte.....	127,089.10	4,104,347.75	9,608.97	2,790,528.78	1,254,781.58	59,037,939
Nevada: Newlands.....	21,490.88	1,206,511.54	15,325.30	1,131,308.74	73,635.92	1,566.88
New Mexico: Carlsbad.....	15.90	885,710.89	15.90	885,629.64	81.25	
New Mexico - Texas: Rio Grande.....		3,092,524.45		2,781,599.45	310,925.00	
Oregon: Umatilla.....	2,483.29	543,057.17	2,259.29	401,929.48	5,190.89	135,936.80
Oregon-California: Klamath.....	3,052.05	1,147,504.19	7,169.75	1,140,303.09	4,292.90	2,908.20
South Dakota: Belle Fourche.....	2,505.15	626,634.24	343.29	546,198.33	80,435.91	
Utah:						
Salt Lake Basin.....		1,222.50		1,222.50		
Strawberry Valley.....	¹ 56,610.54	1,317,134.96	32,075.35	1,306,221.74	10,913.22	
Washington:						
Okanogan.....	2,825.94	137,475.86	2,825.94	137,475.86		
Yakima.....	144,248.77	6,878,761.73	51,726.31	6,641,749.90	36,363.75	200,648.08
Wyoming: Shoshone.....	2,010.59	984,321.01	422.29	820,318.76	163,657.89	344.36
Total.....	529,232.24	46,909,702.58	228,837.48	42,739,961.60	² 3,629,807.95	539,933.03
Paid in advance of due dates.....			¹ 64,651.71	913,609.41	³ 221,047.40	
Refunds.....				98,926.60	3,212.84	
Total collections.....			164,185.77	43,752,497.61		
Contributed funds applying to construction cost not in- cluded in above table.....			¹ 3,999.98	1,777,257.33		

¹ Contra.² Other credits for fiscal year, \$244,995.96.³ Decrease for fiscal year, \$9,809.64.

RECLAMATION TABLE 6.—Accounts receivable, operation and maintenance charges (after public notice)

State and project	Due		Collected			Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash		Other credits to June 30, 1936	
			Fiscal year 1936	To June 30, 1936		
Arizona: Yuma auxiliary	\$15,012.96	\$483,405.89	\$20,619.53	\$466,035.10	\$11,705.76	\$5,665.03
Arizona-California: Yuma	112,992.53	3,885,436.24	97,977.43	3,666,185.72	177,604.50	41,646.02
California: Orland	32,617.07	667,760.45	30,125.91	606,128.34	24,818.88	36,813.23
Colorado:						
Grand Valley	49,695.62	408,211.86	36,195.62	373,711.86	33,000.00	1,500.00
Uncompahgre		1,008,683.69		977,809.79	30,873.90	
Idaho:						
Boise	18,929.03	2,190,166.77	21,929.03	2,137,517.05	52,649.72	
King Hill		60,711.27		59,192.22	1,519.05	
Minidoka	52,159.03	2,123,412.74	44,916.65	1,993,320.98	129,843.66	248.10
Montana:						
Huntley		554,787.34		543,594.31	11,193.03	
Milk River	39,636.61	371,097.68	42,938.20	352,722.84	1,662.25	16,712.59
Sun River		168,718.50		164,366.28	4,352.22	
Montana-North Dakota: Lower Yellowstone	1,921.45	338,562.56	1,921.45	338,557.93	4.63	
Nebraska-Wyoming: North Platte	20,848.47	1,931,978.69	17,575.51	1,856,382.44	65,098.35	10,497.90
Nevada: Newlands		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad	40,189.32	973,594.57	40,189.32	956,721.86	16,872.71	
New Mexico-Texas: Rio Grande	289,089.23	4,338,659.63	253,258.61	4,058,056.02	236,403.61	44,200.00
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon:						
Umatilla	3,286.37	388,888.02	2,306.36	380,654.05	7,253.96	980.01
Vale	12,363.08	23,149.67	12,363.08	23,149.67		
Oregon-California: Klamath	50,442.68	1,340,969.27	50,312.70	1,305,999.26	30,536.22	4,433.79
Oregon-Idaho: Owyhee	250.00	500.00	250.00	500.00		
South Dakota: Belle Fourche	71,304.07	1,203,613.43	71,304.07	1,194,237.44	9,375.99	
Utah: Strawberry Valley		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan		371,441.72		368,788.67	2,653.05	
Yakima	227,373.65	5,606,757.99	222,192.28	5,418,829.81	66,492.28	121,435.90
Wyoming: Shoshone	2,211.83	556,284.79	2,104.03	531,432.76	23,705.43	1,146.60
Total	1,037,480.10	30,584,615.38	964,636.88	29,311,178.32	2,988,157.89	285,279.17
Paid in advance of due dates			16,708.11	122,199.21	258.34	
Penalties and interest			6,860.93	519,719.87		
Refunds				38,228.87	156.00	
Total collections			954,789.70	29,991,326.27		

¹ Contra.² Other credits for fiscal year, \$41,089.34.³ Increase for fiscal year, \$236.03.

RECLAMATION TABLE 7.—*Accounts receivable, rental of irrigation water*

State and project	Due		Collected		Other credits to June 30, 1936	Uncollected June 30, 1936
	Fiscal year 1936	To June 30, 1936	Cash			
			Fiscal year 1936	To June 30, 1936		
Arizona:						
Salt River.....		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary.....	\$968. 48	13, 396. 93	\$621. 00	13, 049. 45		\$347. 48
Arizona-California: Yuma.....	9, 268. 93	556, 913. 02	9, 840. 81	544, 258. 83	\$12, 654. 19	
California: Orland.....		121, 450. 85		121, 450. 85		
Colorado:						
Grand Valley.....	10, 897. 70	522, 828. 26	10, 896. 07	514, 091. 93	6, 500. 67	2, 235. 66
Uncompahgre.....	1, 690. 61	1, 226, 460. 37	351. 52	1, 219, 394. 40		7, 065. 97
Idaho:						
Boise.....	8, 050. 00	806, 038. 57	8, 050. 00	801, 318. 07	4, 720. 50	
Minidoka.....	57, 301. 11	740, 243. 04	57, 306. 11	736, 860. 03	3, 383. 01	
Montana:						
Huntley.....	588. 83	12, 440. 25	588. 83	12, 440. 25		
Milk River.....	591. 78	238, 327. 50	576. 78	227, 965. 72	1, 208. 14	9, 153. 64
Sun River.....	241. 06	132, 592. 55	862. 92	130, 512. 40	1, 366. 62	713. 53
Montana - North Dakota:						
Lower Yellowstone.....	534. 60	136, 583. 60	342. 00	136, 005. 98		577. 62
Nebraska-Wyoming: North Platte.....	1, 812. 88	346, 756. 52	1, 838. 13	346, 746. 52	10. 00	
Nevada: Newlands.....		28, 291. 16		22, 114. 31	6, 176. 85	
New Mexico:						
Carlsbad.....	382. 68	40, 499. 27	382. 68	40, 482. 02		17. 25
Hondo.....		9, 129. 70		9, 129. 70		
New Mexico-Texas: Rio Grande.....	28, 717. 92	1, 507, 458. 70	29, 519. 94	1, 493, 313. 66		14, 145. 04
North Dakota:						
Buford-Trenton.....		31. 75		31. 75		
Williston.....		2, 117. 28		2, 117. 28		
Oregon:						
Umatilla.....	1, 171. 80	97, 449. 32	1, 671. 80	71, 172. 52		26, 276. 80
Vale.....	1 208. 15	21, 917. 70	137. 22	21, 211. 17		706. 53
Oregon-California: Klamath.....	43, 840. 07	398, 685. 29	45, 118. 08	395, 734. 09	25. 00	2, 926. 20
Oregon-Idaho: Owyhee.....	12, 272. 75	16, 922. 15	12, 253. 85	16, 868. 25		53. 90
South Dakota: Belle Fourche.....	414. 50	10, 331. 90	642. 80	10, 314. 10	17. 80	
Utah: Strawberry Valley.....		17, 596. 13		17, 596. 13		
Washington:						
Okanogan.....		110, 645. 28		108, 061. 09	2, 584. 19	
Yakima.....	1 5, 945. 55	177, 982. 57	2, 218. 40	176, 592. 82		1, 389. 75
Wyoming:						
Riverton.....	23, 865. 34	64, 661. 67	21, 178. 92	58, 015. 94	6, 550. 73	95. 00
Shoshone.....	10, 727. 43	95, 945. 00	8, 329. 87	92, 193. 36	3, 590. 79	160. 85
Total.....	207, 184. 77	9, 700, 422. 34	212, 727. 73	9, 585, 768. 63	2 48,788. 49	65, 865. 22

¹ Contra.² Other credits for fiscal year, \$5,795.45.RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1936*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction.....	\$99, 805, 891. 33
103. Other physical properties.....	1, 283, 577. 23
104. Investigations, Colorado River Basin.....	229, 944. 23
104. Investigations, Parker-Gila project.....	67, 052. 29
105. Interest during construction—Other capital expenditures.....	10, 338, 522. 03

Total investments (schedule 2)..... \$111, 724, 987. 11

RECLAMATION TABLE 8.—*Financial statement, Boulder Canyon project, June 30, 1936—Continued*

ASSETS AND OTHER DEBITS—Continued

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:

For advances to Colorado River Dam fund.....	\$14,135,906.79
Colorado River Dam fund.....	144,801.67
N. I. R. A.—Parker-Gila project.....	26.52
Collections in transit.....	38,399.39

Total Treasury cash (schedule 1)..... 14,319,134.37

122. Disbursing officers' cash (schedule 1)..... 205,783.63

124. Accounts receivable..... 67,580.95

Total current and accrued assets..... \$14,592,498.95

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionment accounts..... ¹\$23,645.01

143. Field cost adjustments..... 566,557.66

145. Jobbing accounts..... 2,608.59

146. Prepayments..... 9,962.13

171. Unadjusted debits..... 44,269.08

Total deferred and unadjusted debits..... 599,752.45

Total assets and other debits..... 126,917,238.51

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205. Long-term liability: U. S. Treasury authorized appropriation..... \$126,500,000.00

161. Less: Authorized but not appropriated..... 13,240,000.00

Total long-term liability:

205.2. Appropriated but not advanced..... 14,135,906.79

205.3. Appropriated and advanced..... 99,124,093.21

205.4. Less: Impounded, Legislative Economy Act..... ¹137,653.66

206. N. I. R. A. allotment—Parker-Gila project..... 93,000.00

113,215,346.34

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:

211.1. Contractor's earnings—current..... \$1,914,519.72

211.11. Contractors' earnings—holdback..... 209,285.90

211.2. Labor..... 105,202.49

211.3. Purchases..... 57,968.59

211.4. Freight and express..... 370,104.87

211.5. Passenger fares..... 722.97

211.9. Miscellaneous..... 44,149.00

Total audited accounts payable..... 2,702,003.54

214. Matured interest..... 10,312,890.45

Total current and accrued liabilities..... 13,014,893.99

XII. OTHER CREDITS

220. Consumers' meter deposits..... 15.00

XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits..... 128,465.94

XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested..... 585,517.24

Total liabilities and other credits..... 126,917,238.51

¹ Contra.

RECLAMATION TABLE 9.—*Appropriations and cash statement, Boulder Canyon project, June 30, 1936*

TREASURY CASH

	Regular appropriations	N. I. R. A. allotment	Total	N. I. R. A. Parker-Gila project
Appropriations and allotments.....	\$75,260,000.00	\$38,000,000.00	\$113,260,000.00	\$93,000.00
Advances to Colorado River Dam fund.....	61,277,358.70	37,846,734.51	99,124,093.21	-----
Balance not advanced.....	13,982,641.30	153,265.49	14,135,906.79	-----
Colorado River Dam fund:				
Advanced from appropriation to fund.....	61,277,358.70	37,846,734.51	99,124,093.21	-----
Collections deposited in fund.....	400,783.42	21,331.15	422,114.57	26.52
Total advances and collections.....	61,678,142.12	37,868,065.66	99,546,207.78	93,026.52
Disbursements by General Accounting Office.....	4,974,315.63	54,245.70	5,028,561.33	-----
Advances to disbursing officers.....	56,563,786.68	37,809,058.10	94,372,844.78	93,000.00
Total withdrawals.....	61,538,102.31	37,863,303.80	99,401,406.11	-----
Balance.....	140,039.81	4,761.86	144,801.67	26.52
Repay collections in transit.....	-----	-----	-----	-----
Miscellaneous collections in transit.....	38,399.39	-----	38,399.39	-----
Treasury cash—Available for expenditures.....	12,161,080.50	158,027.35	12,319,107.85	-----
Treasury cash—Reserve.....	2,000,000.00	-----	2,000,000.00	-----
Total treasury cash (G. L. 121).....	14,161,080.50	158,027.35	14,319,107.85	26.52

DISBURSING OFFICERS' CASH

Advances and appropriation transfer adjustments.....	\$56,574,020.57	\$37,815,687.98	\$94,389,708.55	\$93,000.00
Disbursing officers' disbursements.....	56,447,298.57	37,762,547.29	94,209,845.86	67,079.06
Disbursing officers' checking balance.....	126,722.00	53,140.69	179,862.69	25,920.94
Collections by disbursing officers.....	441,777.79	27,779.75	469,557.54	26.52
Collections deposited and appropriation transfer adjustment.....	441,777.79	27,779.75	469,557.54	26.52
Collections not deposited.....	-----	-----	-----	-----
Total disbursing officers' cash (G. L. 122).....	126,722.00	53,140.69	179,862.69	25,920.94

RECLAMATION TABLE 10.—*Financial statement, All-American Canal, June 30, 1936*

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction..... \$7,393,107.36

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:

 For advances to Colorado River Dam fund..... \$6,500,000.00
 N. I. R. A. and Emergency Relief allotment..... 10,234,245.26
 Contributions—Imperial irrigation district..... 4,224.62
 Collections in transit..... 779.25

 Total Treasury cash..... 16,739,249.13

122. Disbursing officers' cash..... 3,636,503.06

124. Accounts receivable..... 1,665.61

 Total current and accrued assets..... 20,377,417.80

RECLAMATION TABLE 10.—*Financial statement, All-American Canal, June 30, 1936—Continued*

ASSETS AND OTHER DEBITS—Continued

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionments.....	\$8,838.34	
143. Field cost adjustments.....	271,396.68	
146. Prepayments.....	1,231.49	
171. Unadjusted debits.....	32,488.59	
	<hr/>	
Total deferred and unadjusted debits.....		\$296,278.42
		<hr/>
Total assets and other debits.....		28,066,803.58
		<hr/>

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205. Long-term liability: U. S. Treasury authorized appropriation.....	\$38,500,000.00	
161. Less: Authorized but not appropriated.....	11,500,000.00	
	<hr/>	
Total long-term liability:		
205.2. Appropriated but not advanced.....	6,500,000.00	
205.3. Appropriated and advanced.....	20,500,000.00	
	<hr/>	
		27,000,000.00

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:		
211.1 Contractors' earnings—current.....	\$423,981.89	
211.11 Contractors' earnings—holdback.....	516,733.68	
211.2 Labor.....	16,858.17	
211.3 Purchases.....	15,574.50	
211.4 Freight and express.....	81,018.36	
211.5 Passenger fares.....	348.30	
211.9 Miscellaneous.....	568.03	
	<hr/>	
Total current and accrued liabilities.....		1,055,082.93

XII. OTHER CREDITS

226. Contributed funds—Imperial irrigation district.....	10,000.00
--	-----------

XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits.....	\$640.82	
231.1 Unadjusted credits—Yuma project.....	469.13	
	<hr/>	
Total deferred and unadjusted credits.....		1,109.95

XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested.....	610.70	
	<hr/>	
Total liabilities and other credits.....		28,066,803.58

RECLAMATION TABLE 11.—*Appropriations and cash statement, All-American Canal, June 30, 1936*

TREASURY CASH

	N. I. R. A. allotment	P. W. A. al- lotment	Emergency Relief allot- ment	Total	Regular ap- propriation	Contrib- uted funds, Imperial Irrigation District
Appropriations and al- lotments.....	\$6,000,000.00	\$3,000,000.00	\$11,500,000.00	\$20,500,000.00	\$6,500,000.00	\$10,000.00
Advances to Colorado River Dam Fund.....						
Balance not ad- vanced.....					6,500,000.00	
Advanced from appro- priation.....						
Collections deposited.....	9,594.43	3,090.60	263.19	12,948.22		
Total advances, etc.....	6,009,594.43	3,003,090.60	11,500,263.19	20,512,948.22		10,000.00
Disbursements by General Accounting Office.....	61,164.24	16.17	497.21	61,677.62		
Advances to disbursing officers.....	5,198,703.36	1,518,321.98	3,500,000.00	10,217,025.34		10,000.00
Total withdrawals.....	5,259,867.60	1,518,338.15	3,500,497.21	10,278,702.96		10,000.00
Balance.....	749,726.83	1,484,752.45	7,999,765.98	10,234,245.26		
Repay collections.....	780.00		*.75	779.25		
Total Treasury cash.....	750,506.83	1,484,752.45	7,999,765.23	10,235,024.51	6,500,000.00	

DISBURSING OFFICERS' CASH

Advances and appro- priation transfers.....	\$5,198,878.34	\$1,518,321.98	\$3,500,000.00	\$10,217,200.32		\$10,000.00
Disbursing by disburs- ing officers.....	4,226,258.07	970,440.13	1,384,000.06	6,580,698.26		5,775.38
Disbursing offi- cers' cash bal- ance.....	972,620.27	547,881.85	2,115,999.94	3,636,502.06		4,224.62
Collections by disburs- ing officer.....	10,478.91	3,090.60	263.19	13,832.70		10,000.00
Collections deposited.....	10,478.66	3,090.60	262.44	13,831.70		10,000.00
Collections not de- posited.....	.25		.75	1.00		
Disbursing offi- cers' cash bal- ance.....	972,620.52	547,881.85	2,116,000.69	3,636,503.06		4,224.62

RECLAMATION TABLE 22.—*Irrigation and crop results on Government projects, 1935*

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River.....	242,935	231,463	228,435	\$18,638,893	\$81.60	93,967	54,320	65,338	\$3,817,957	\$58.43
California: Yuma.....	67,453	48,815	46,261	2,664,291	57.70	165	158	154	18,170	118.37
Valley division.....	49,896	39,957	37,928	2,148,929	56.72					
Reservation division.....	7,743	3,208	2,932	126,979	43.30					
Bard division.....	6,004	4,433	4,258	197,653	46.40					
Yuma auxiliary (Mesa).....	3,810	1,217	1,143	190,730	166.82					
California: Orland.....	20,634	13,786	13,116	341,625	26.05					
Colorado: Grand Valley.....	23,230	15,185	15,590	452,925	29.05	10,000	7,009	7,009	359,560	51.30
Uncompahgre.....	75,654	60,968	60,808	1,423,621	23.39	1,650	1,550	1,490	38,740	26.00
Idaho: Boise.....	165,783	147,372	146,243	3,659,231	25.02	144,068	136,911	128,052	3,174,000	24.79
New York irrigation district.....	16,974	14,821	14,769	250,900	16.99					
Nampa-Meridian irrigation district.....	36,704	34,293	34,254	774,636	22.61					
Boise-Kuna irrigation district.....	47,560	42,900	42,890	923,636	21.53					
Wilder irrigation district.....	55,951	47,601	46,582	1,509,835	32.41					
Big Bend irrigation district.....	1,703	1,315	1,311	27,785	21.19					
Black Canyon irrigation district.....	6,891	6,442	6,437	172,439	26.79					
Minidoka.....	193,075	167,825	160,807	4,040,522	25.11	716,644	671,372	630,460	19,329,760	30.68
Minidoka irrigation district.....	67,692	60,556	56,591	1,544,058	27.28					
Burley irrigation district.....	47,918	44,930	41,877	1,307,210	31.21					
Gooding division.....	77,465	62,339	62,339	1,189,254	19.08					
Montana: Bitter Root irrigation district.....	17,375	15,053	15,053	308,769	20.51					
Huntley.....	29,473	23,728	23,728	702,840	29.62					
Milk River.....	134,557	55,412	55,412	1,306,085	23.57					
Malta division.....	56,652	23,137	23,137	405,237	17.52					
Glasgow division.....	22,133	6,762	6,762	81,472	12.05					
Chinook division.....	55,772	25,513	25,513	819,316	32.11					
Sun River.....	60,616	43,383	43,383	776,097	17.87					
Fort Shaw division.....	13,902	7,703	7,707	131,307	17.04					
Greenfields and Big Coulee division.....	46,714	35,779	35,676	644,790	18.07					
Montana-North Dakota: Lower Yellowstone.....	58,248	38,638	38,638	1,550,483	40.13					
District no. 1.....	38,000	26,076	26,076	1,079,242	41.39					
District no. 2.....	20,248	12,562	12,562	471,241	37.51					

RECLAMATION TABLE 22.—*Irrigation and crop results on Government projects, 1935—Continued*

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Nebraska-Wyoming:										
North Platte.....	224,419	191,993	190,115	\$4,959,443	\$26.10					
Pathfinder irrigation district.....	112,132	81,744	80,263	1,862,206	23.20					
Gering and Fort Laramie irrigation district.....	54,793	53,105	52,708	1,678,275	31.80					
Goshute irrigation district.....	51,324	42,493	42,493	1,288,201	30.32					
Northport irrigation district.....	16,170	14,651	14,651	130,761	8.93					
Nevada: Newlands.....	69,524	44,223	42,522	696,912	16.39					
New Mexico: Carlisbad.....	25,055	24,433	17,103	831,712	48.03					
New Mexico-Texas:										
Rio Grande.....	155,000	120,075	114,658	7,731,907	67.40	77,000	44,358	44,316	1,526,530	34.45
Elephant Butte irrigation district.....	88,000	65,425	61,417	4,213,011	68.60					
El Paso County Butte irrigation district no. 1.....	67,000	54,650	53,241	3,518,806	66.00					
Oregon:										
Umatilla.....	14,298	11,674	11,275	195,211	17.31	842	682	666	18,000	27.03
East division.....	8,163	7,412	7,107	113,827	16.02					
West division.....	6,135	4,292	4,168	81,384	19.50					
Vale.....	15,395	8,071	6,995	136,046	19.45					
Oregon-California:										
Klamath.....	61,127	50,536	49,462	2,222,938	44.94	59,545	36,925	35,665	1,155,070	32.39
Main division.....	40,987	31,347	30,523	1,115,374	36.54					
Tule Lake division.....	20,140	19,189	18,939	1,107,564	58.50					
Oregon-Idaho:										
Owyhee.....	14,026	4,917	4,374	85,268	19.49					
Advancement irrigation district.....	699	539	534	15,182	28.43					
Kingman Kolony irrigation district.....	1,258	878	874	17,261	19.75					
Mitchell Butte irrigation district.....	12,069	3,500	2,966	52,525	17.81					
South Dakota: Belle Fourche.....	72,861	39,225	46,081	1,026,675	22.30					
Utah:										
Salt Lake Basin.....						89,000	86,500	85,206	3,677,382	41.98
Hyrum.....	7,488	7,488	7,488	158,986	21.23					
Strawberry Valley.....	41,829	36,293	36,067	836,827	23.20					
High Line division.....	18,888	15,690	15,527	250,943	16.16	7,164	6,589	6,589	171,007	25.95
Spanish Fork division.....	14,043	12,603	12,596	324,805	25.79					
Springville-Mapleton division.....	8,898	7,991	7,944	261,079	32.80					
Washington:										
Okanogan.....	5,076	3,728	3,568	599,245	167.97					
Yakima.....	202,525	167,409	159,310	7,034,940	44.18	172,217	148,629	147,948	7,322,155	49.49

Sunnyside division.....	102,551	84,828	79,561	3,143,676	39.51				
Tieton division.....	29,794	26,100	24,080	2,540,317	105.49				
Kittitas division.....	70,180	56,481	55,669	1,350,947	24.27				
Yosemite division.....									
Riverbank.....	32,000	14,947	14,717	185,686	12.62	277	277	2,870	10.36
Shoshone.....	73,850	53,107	52,897	1,034,485	19.55				
Garland division.....	41,879	31,491	31,491	1,768,876	24.42				
Franklin division.....	20,031	13,955	13,955	169,701	12.16				
Willwood division.....	11,840	7,961	7,451	95,908	12.87				
Total with irrigation, 1935.....	2,113,506	1,640,936	1,604,166	63,601,663	39.65	1,500,589	1,294,680	1,256,970	43,179,631
Warren Act lands.....	1,500,589	1,294,080	1,256,970	43,179,631	34.35				34.35
Grand total of projects proper and Warren Act.....	3,614,095	2,935,616	2,861,136	106,781,294	37.30				
Grand total, 1934.....	3,494,645	2,837,205	2,756,698	100,943,714	36.65				
Increase.....	119,450	98,411	104,438	5,837,580	.65				

RECLAMATION TABLE 23.—*Summary of crop results on reclamation projects in 1935*

(NOTE.—These detailed figures are limited to crops covered by census on Government projects proper, excluding all crops in areas served with water under the Warren Act, but including nonirrigated crops grown on the projects.)

Crop	Average cropped		Yields		Crop value			
	Total	Per- cent of cropped	Total	Average per acre	Average per unit	Total	Average per acre	Percent of total value of all crops
Cereals:			<i>Bushels</i>					
Barley.....	75,371	4.7	2,869,161	38.1	\$0.41	\$1,177,909	\$15.65	1.9
Corn.....	78,960	4.9	2,077,502	26.3	.58	1,199,016	15.22	1.9
Oats.....	76,295	4.8	3,001,971	39.4	.31	936,185	12.25	1.4
Rye.....	1,619	.1	24,683	15.2	.48	11,745	7.26	.1
Wheat.....	170,220	10.6	4,921,513	28.9	.75	3,707,964	21.75	5.8
Total.....	402,465	25.1	12,894,830	32.1	.54 ¹ / ₂	7,032,819	17.45	11.1
Seeds:								
Alfalfa.....	25,551	1.6	83,036	3.2	6.34	525,621	20.55	.8
Clover.....	7,602	.5	33,373	4.4	6.15	205,338	27.05	.3
Other.....	29,386	1.8	518,544	17.7	2.37	1,227,251	41.70	2.0
Total.....	62,539	3.9	634,953	10.2	3.13	1,958,210	31.30	3.1
Hay and forage:			<i>Tons</i>					
Alfalfa hay.....	476,696	29.7	1,441,060	3.0	7.28	10,487,913	22.00	16.5
Clover hay.....	7,324	.5	11,009	1.5	4.79	52,695	7.20	.1
Other hay.....	107,304	6.7	155,829	1.5	9.20	1,433,758	13.35	2.2
Corn forage.....	17,851	1.1	70,270	3.9	3.83	269,278	15.07	.4
Other forage.....	158,643	9.9	51,183	.3	7.37	376,963	2.37	.6
Pasture.....	444,297	27.6				2,703,599	6.08	4.2
Total.....	1,212,115	75.5	1,729,351	1.4		15,324,206	12.65	24.0
Vegetables and truck:			<i>Bushels</i>					
Beans.....	33,530	2.1	660,273	19.7	1.28	847,950	25.30	1.3
Onions.....	2,672	.2	845,523	316.5	.39	326,161	122.00	.5
Potatoes, white.....	67,142	4.2	12,965,960	193.3	.34	4,439,361	66.20	7.0
Potatoes, sweet.....	1,827	.1	197,490	108.1	.71	140,336	76.70	.2
Truck.....	59,985	3.7	5,306,550	88.4	1.23	6,535,620	108.80	10.3
Total.....	165,156	10.3	19,975,796	121.1	.61	12,289,428	74.40	19.3
Fruits and nuts:			<i>Pounds</i>					
Apples.....	24,210	1.5	355,395,675	14,700	.008	2,927,409	120.75	4.6
Peaches.....	3,738	.2	20,287,987	5,430	.022	442,821	118.50	.7
Pears.....	8,112	.5	79,858,231	9,840	.009	725,040	89.40	1.1
Prunes.....	2,133	.1	18,958,181	8,920	.012	233,944	109.70	.4
Citrus fruit.....	11,839	.8	166,292,580	14,050	.017	2,919,266	246.50	4.6
Small fruit.....	6,935	.4	20,823,919	3,000	.05	1,041,895	150.50	1.6
Miscellaneous.....	4,276	.3	4,011,069	950	.04	170,638	39.90	.3
Total.....	61,243	3.8	665,627,642	10,850	.013	8,461,013	138.00	13.3
Miscellaneous:			<i>Tons</i>					
Sugar beets.....	76,306	4.7	914,262	12.0	5.92	5,402,891	70.80	8.5
Cotton.....	132,693	8.3	128,120	.96	67.50	8,652,647	65.20	13.6
Cotton seed.....	132,693	8.3	57,224	.43	32.10	1,835,142	13.82	2.9
Other crops.....	139,961	8.7				2,645,307	18.90	4.2
Total.....	481,653	30.0				18,535,987	38.50	29.2
Grand total, projects.....	2,385,171							
Duplication.....	781,005	48.6						
Total all crops for which detailed census was taken.....	1,604,166	100.0				63,601,663	39.65	100.0
Total Warren Act crops.....	1,256,970					43,179,631	34.35	
Grand total.....	2,861,136					106,781,294	37.30	

¹ Bales of 500 pounds each.

RECLAMATION TABLE 24.—*Irrigated and cropped acreage and crop values by years, 1906-95*

	Federal irrigation projects				Warren Act land				Entire area		
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Cropped acreage	Crop value	
			For year	Cumulative total			For year	Cumulative total		For year	Cumulative total
1906	22,300	1,20,100	\$244,900	\$5,005,300					1,20,100	\$244,900	\$5,005,300
1907	187,000	1,169,000	4,760,400	12,581,100					1,169,000	4,760,400	12,581,100
1908	289,500	1,260,500	7,575,800	24,501,800					1,260,500	7,575,800	24,501,800
1909	410,600	1,369,500	11,920,700	37,476,400					1,369,500	11,920,700	37,476,400
1910	465,100	1,413,000	12,974,600	50,185,000					1,413,000	12,974,600	50,185,000
1911	541,400	1,470,100	12,708,600	63,010,400					1,470,100	12,708,600	63,010,400
1912	588,400	1,540,000	13,825,400	79,742,000					1,540,000	13,825,400	79,742,000
1913	699,200	1,642,000	15,732,200	96,218,100					1,642,000	15,732,200	96,218,100
1914	761,300	1,705,400	16,475,500	114,418,100					1,705,400	16,475,500	114,418,100
1915	814,900	1,760,000	18,200,000	147,234,100					1,760,000	18,200,000	147,234,100
1916	923,000	1,838,300	32,816,000	203,696,400					1,838,300	32,816,000	203,696,400
1917	1,057,500	1,966,800	56,462,300	270,517,800					1,966,800	56,462,300	270,517,800
1918	1,141,500	2,051,200	66,821,400	359,491,900					2,051,200	66,821,400	359,491,900
1919	1,187,300	2,113,500	88,974,100	445,663,000					2,113,500	88,974,100	445,663,000
1920	1,223,500	2,153,800	66,171,700	511,834,700					2,153,800	66,171,700	511,834,700
1921	1,227,500	2,157,900	49,620,300	561,455,000					2,157,900	49,620,300	561,455,000
1922	1,202,130	2,169,100	50,360,900	611,815,900					2,169,100	50,360,900	611,815,900
1923	1,213,700	2,179,870	65,046,300	676,862,200					2,179,870	65,046,300	676,862,200
1924	1,290,900	2,216,600	66,488,600	743,350,800					2,216,600	66,488,600	743,350,800
1925	1,320,300	2,242,800	77,608,900	820,959,700					2,242,800	77,608,900	820,959,700
1926	1,411,000	2,361,500	60,664,900	881,624,600					2,361,500	60,664,900	881,624,600
1927	1,379,000	2,489,200	72,047,200	953,671,800					2,489,200	72,047,200	953,671,800
1928	1,442,100	2,590,500	88,459,390	1,042,131,190					2,590,500	88,459,390	1,042,131,190
1929	1,483,900	2,707,800	93,037,890	1,135,169,080					2,707,800	93,037,890	1,135,169,080
1930	1,504,810	2,820,350	65,007,270	1,200,176,350					2,820,350	65,007,270	1,200,176,350
1931	1,552,718	2,920,354	40,554,037	1,240,730,387					2,920,354	40,554,037	1,240,730,387
1932	1,585,144	3,015,162	31,531,162	1,272,261,549					3,015,162	31,531,162	1,272,261,549
1933	1,589,770	3,098,780	48,765,863	1,321,027,412					3,098,780	48,765,863	1,321,027,412
1934	1,552,124	3,127,104	60,928,969	1,381,956,381					3,127,104	60,928,969	1,381,956,381
1935	1,640,936	3,204,166	63,601,663	1,445,558,044					3,204,166	63,601,663	1,445,558,044

1 Estimated.

THE NATIONAL PARK SERVICE

(ARNO B. CAMMERER, *Director*)

Preeminence of the National Park Service as the leader in the recreational field reached new heights during the year, with the establishment of new parks, the continuation of the emergency programs, and the enactment of legislation providing for Nation-wide surveys of areas of interest from the recreational and educational stand-points.

Increase in the acreage of the national park and monument system was achieved through the establishment of the new Shenandoah (Va.) and Mammoth Cave (Ky.) National Parks—the latter for administration and protection only—and increases in the areas of several national parks and monuments through boundary adjustment. Establishment of 11 new national monuments and other historical areas was authorized by Congress, dependent upon conditions yet to be met. Primarily, the actual establishment of these new areas depends upon the acquisition of the necessary acreage by donation of lands or of funds to purchase them.

Public use of the national parks and monuments has pointed to the need for an expanded system. Visitors for the travel year ended September 30, 1935, amounted to 7,676,490, an increase of 21 percent over the preceding year. Preliminary estimates of travel to the scenic national parks for the period October 1, 1935, to June 30, 1936, indicate an increase of approximately 28 percent over the same period last year. As a corollary of this increased travel, the business of the operators of visitors' accommodations in the parks shows a like improvement.

As indicated by the increase in preseason travel, winter use of the national parks reflected gains along a wide front. All possible encouragement is given to the development of informal snow and ice sports in areas suitable for such use, in accordance with the popular demand. Such sports, however, as in the case of summer amusement, are restricted to those compatible with the surroundings.

The warm interest in park activities and use displayed by President Roosevelt on his visit to several areas in the system, notably the Hot Springs, Abraham Lincoln, and Shenandoah National Parks and the Colonial National Historical Park, was a source of inspiration to the local officials, as well as to the Washington office. So also was the

sympathetic interest displayed by the Secretary of the Interior and other officials of the Department. The cooperation of the Director of Emergency Conservation Work and of specialists in various other Federal bureaus was invaluable during this period.

Cooperation furnished by the various emergency recovery organizations has been an outstanding factor in enabling the National Park Service to meet the increased demands upon it resulting from increased use of the parks and the addition of new areas to the system. Public Works, Emergency Conservation Work, Works Progress, and the Resettlement Administration made available Federal funds and adequate man-power, resulting in a wide variety of long-needed developments throughout the system of national parks and monuments.

Foremost among congressional legislation, affecting the national parks, was the act providing for the preservation of historic American sites, buildings, objects, and antiquities of national significance, which empowers the Secretary of the Interior to conduct a Nationwide survey of historic buildings and sites and makes it possible for the Federal Government to acquire those determined to be of sufficient importance to warrant such action; and the State Park Act, authorizing a comprehensive study, other than on lands under the jurisdiction of the Department of Agriculture, of the public park, parkway, and recreational-area programs of the United States, and of the several States and political subdivisions thereof, and of the lands throughout the United States which are or may be chiefly valuable as such areas, and to aid the States and the political subdivisions thereof in planning the development of such recreational areas.

Shortly before the close of the last session of Congress, an amendment authorizing the construction of the Grand Lake-Big Thompson transmountain diversion project in Rocky Mountain National Park, was deleted from the Interior Department appropriation bill. Inclusion of the item in the bill followed the allotment of \$150,000 of Public Works funds to make a survey of the project. Although the survey had not been completed, the Senate, on March 2, 1936, adopted an amendment to the Interior Department bill authorizing construction of the project. Various national conservation organizations vigorously protested the Senate amendment, upon the basis that the diversion project would violate the most sacred principle of national park conservation—that of freedom from commercial or economic exploitation—and that approval of such a project would establish a precedent for the commercial invasion of other parks. The National Park Service also protested the amendment, stressing the fact that such a project would be an alien and nonconforming use within a national park. Exhaustive hearings were held by the

subcommittee of the House Committee on Appropriations in charge of the Interior Department appropriation bill. The Bureau of Reclamation is continuing its survey of the project, under the \$150,000 Public Works allotment provided for that purpose.

Legislation was enacted authorizing prospecting and mining within the Glacier Bay National Monument. Numerous conservation organizations protested the passage of this bill. The mining operations authorized under the new law are to be subject to such general regulations as may be prescribed by the Secretary of the Interior.

A study has been made to determine the recreational possibilities at Boulder Dam under which the National Park Service would cooperate with the Bureau of Reclamation in planning the recreational developments along Lake Mead, the largest artificial lake ever created, extending as it does 115 miles behind Boulder Dam. In the meantime the National Park Service has supervised recreational development on the lake with Civilian Conservation Corps enrollees.

During the year, following a council meeting of national park superintendents in Washington, recommendation was made to the Secretary of the Interior for the regionalization of the National Park Service. Four regions were recommended, with headquarters in Richmond, Va.; Omaha, Nebr.; Santa Fe, N. Mex.; and San Francisco, Calif. Action on this general regionalization was deferred until fall. Meanwhile, the seven regions through which Emergency Conservation Work had been administered in the field by the National Park Service were reduced to four, in aid of economy. These E. C. W. regions coincide in boundaries with the regions recommended for general national park regionalization, but the headquarters of the third region have remained at Oklahoma City, Okla., instead of moving to Santa Fe, as proposed in the general plan.

Important steps were taken toward the establishment of international park and wildlife refuges along the Mexican-United States boundary, following the authorization by Congress in 1935 of the establishment of a Big Bend National Park and the recommendation of the Secretary of the Interior that the Mexican Government be invited to establish a national park in Mexico, adjoining the proposed Big Bend Park, the whole to be an international park similar to the Waterton Lakes-Glacier International Peace Park on our northern boundary.

Another token of international amity in the field of national-park administration was the exchange, during the year, of stones from the summits of the two great inactive volcanoes, Fuji and Rainier. On October 23, the Superintendent of the Mount Rainier National Park presented to the Japanese consul at Seattle a volcanic rock that

had been brought down from the summit of Mount Rainier and encased in a chest of native cedar. Two days later this stone was en route on the 4,900-mile journey across the Pacific, arriving in Japan November 8.

On November 14 mountaineer envoys of the National Park Division of the Sanitary Bureau of Japan reached the summit of Fujiyama, which was then covered by early winter snows, and brought to Tokyo a similar stone which, encased in cherry wood, was presented to the American Ambassador to Japan and now is en route to the United States and Mount Rainier National Park. Upon arrival, it will be placed in the park museum.

In connection with the investigation of park areas along the southern international boundary, it is my sad duty to record the tragic automobile accident that occurred at Deming, N. Mex., on February 25, which took the lives of Roger W. Toll and George M. Wright.

The loss of these two valued members of the National Park Service is, in the words of the Advisory Board of the Service, "a major disaster to the cause of conservation which they so nobly upheld and furthered" and one that will be felt for many years to come. Their high ideals, unswerving loyalty, and devotion to principle, added to a practical knowledge of national park work and sound judgment, made them outstanding in a group of executives of which the Service has always been rightly proud. The National Park Service has gained immeasurably through its association with them, and their loss is felt in a corresponding degree.

Service officials and personnel also were greatly saddened by the death on April 19 of Mr. and Mrs. Frederick H. Harvey in an airplane accident. Mr. Harvey, as vice president of the Fred Harvey system which operates facilities for visitors at the South Rim of the Grand Canyon, and chairman of the Western Conference of the National Park Operators, was not only a warm personal friend of the many Service people fortunate enough to know him, but he was also a keen executive, an outstanding civic leader, and a wise counselor to the National Park Service.

EMERGENCY CONSERVATION WORK

The National Park Service continued to participate in the Emergency Conservation Work program through supervising Civilian Conservation Corps activities in the various units of the national park and monument system in State, county, and metropolitan park areas, and in the Territory of Hawaii and the Virgin Islands.

On January 15, 1936, the general administration of Emergency Conservation Work activities in the national parks and monuments,

which since its initiation had been handled by the Chief Forester because of the intimate relationship of that program to the protection of national parks, was, in the interests of economy, transferred to the Branch of Planning and State Cooperation and consolidated with the administration of the larger State park Emergency Conservation Work program.

The largest number of camps operated in the national parks and monuments during the fiscal year was 117 in November 1935, and the smallest number was 80 in February and March 1936. The largest number of State park camps occupied during that period was 457 in October 1935, and the smallest 345 in June 1936.

Ten Civilian Conservation Corps camps were operated by the National Park Service in the Territory of Hawaii, one of these in the Hawaii National Park, and two camps were operated in the Virgin Islands.

All the emergency work in National and State park areas continued to receive the closest scrutiny and supervision from experienced engineers, landscape architects, foresters, wildlife experts, geologists, archeologists, and historians, in order that no important element of park values might be disturbed. Under the plan of regionalization technicians in these various lines were assigned to the four regions to assist in directing the work in the field.

The National Park Service pays tribute to the Emergency Conservation Work technicians and to the enrollees of the Civilian Conservation Corps for invaluable aid given in the protection of the national parks and in the handling of traffic and guiding of visitors. Forest-fire prevention and suppression, tree-disease control, sloping and planting of roadsides, protection of wildlife and of archeological and geological exhibits, construction of trails, automobile campgrounds, parking areas, and picnic grounds, and museum and guide service are among the Civilian Conservation Corps projects that have done most to maintain national-park standards and values.

WORKS PROGRESS ADMINISTRATION WORK CAMPS

During the period December 1, 1935, through June 30, 1936, the National Park Service cooperated with the Works Progress Administration by assuming the responsibility for the technical supervision of the work programs of 41 W. P. A. work camps.

The program was undertaken at the request of the State, county, and municipal agencies sponsoring the camps and with the concurrence of the Works Progress Administration. This program provided an extension of the services rendered to States, counties, and municipalities by the National Park Service in the conservation of natural resources and the coordinated and planned development of

recreational areas for public use. Projects were undertaken on 3 Federal, 22 State, 3 county, and 13 municipal park areas. Although the National Park Service directed the supervision of this program, responsibility for actual operation was vested in the Works Progress Administration.

The Works Progress Administration also requested the National Park Service to assume responsibility for a beach-erosion project on the North Carolina coast. At this time a definite project application is being compiled for the construction of sand fences and plantings of the resulting dunes.

RECREATIONAL DEMONSTRATION PROJECTS

One of the interesting phases of the expanded program of recreational development undertaken by the National Park Service, in cooperation with the State park authorities and State planning boards, has been the development of 46 land-use projects designated as recreational demonstration projects. With Resettlement Administration funds, nearly half a million acres of land were in process of being acquired, at a cost of approximately \$5,000,000 at the close of the fiscal year. The areas are being developed as Federal projects through the cooperation of the Resettlement Administration, Emergency Conservation Work, and Works Progress Administration, either for addition to the State systems of parks and recreational areas as concrete demonstrations in the better use of certain rural lands or for Federal administration in connection with some existing unit of the national park and monument system.

The 46 projects, located in 24 States, are readily accessible to 30,000,000 people. The majority of the projects are planned for the organized camp needs of major metropolitan areas. It is expected that at least 10 organized camps, each with a capacity of from 100 to 125 campers, soon will be in operation.

Wildlife and fire protection work has been initiated on practically all the areas. Recreational facilities other than the organized camps that have been developed include picnic areas, trails, and artificial lakes.

General development programs were prepared for many of these projects and technical supervision furnished by experts of the National Park Service.

COOPERATION WITH STATE PARK AUTHORITIES AND LEGISLATION THEREFOR

The passage of the State Park Act (H. R. 10104) just before the close of the Seventy-fourth Congress will, it is hoped, be a vital factor in making possible the continuation of the close relationship

between the States and the National Park Service already established, regardless of the extent to which the emergency work may be continued. Under this legislation the Secretary of the Interior, through the National Park Service, is authorized to make a Nation-wide study of public park, parkway, and recreational programs, including lands that may be valuable for such purposes, to the end that an adequate system of recreational areas may be developed, and to aid the several States and their political subdivisions in planning such areas. In cooperation with the National Resources Committee work is now under way upon the preparation of an outline of procedure to be followed in conducting the survey. Upon its approval by the Secretary of the Interior the outline will be taken up with the various Federal agencies concerned and with the governors and planning boards of the several States.

An important feature of the State Park Act is its recognition of the principal of regional planning and administration of recreation areas in which two or more States may be involved, and its authorization for such States to enter into agreements with one another with respect to the establishment, planning, improvement, and maintenance of such areas.

STATE AND MUNICIPAL RECREATION STUDIES INAUGURATED

For the purpose of determining the progress of the local park movement during the 5-year period ending December 1935, the National Park Service in cooperation with the National Recreation Association inaugurated a Nation-wide study of municipal, county, and metropolitan parks. The results of this study should prove of great value to the park and recreation movement and meet a real demand on the part of State and local park officials for such up-to-date information. Aviation and other trends in travel are being studied in relation to recreational planning.

Preliminary studies are also being made of the possibility of conducting an extensive survey of world parks.

LAND CHANGES IN NATIONAL PARK AND MONUMENT SYSTEM

With the establishment of two new national parks during the year, the adjustment of boundaries in eight parks and monuments, and the acceptance of donated lands in connection with the Blue Ridge Parkway, the total area of lands under the jurisdiction of the National Park Service on June 30, exclusive of the National Capital parks, was 15,489,821.73 acres. As of that date there were 26 national parks, 2 national historical parks, 67 national monuments, 11

national military parks, 10 battlefield sites, 4 miscellaneous memorials, 11 national cemeteries, and three parkways.

The 692 reservations comprising the National Capital parks, with an area of 6,986.61 acres, are administered as a separate unit of the system.

NEW NATIONAL PARKS

Shenandoah National Park, in Virginia, was established on December 26, 1935, when the Secretary of the Interior accepted from the State of Virginia deeds to 176,429.80 acres of land within the approved park boundaries. This acreage exceeds the minimum authorized by Congress by approximately 16,000 acres. Establishment of the Shenandoah National Park was authorized by act of Congress approved May 22, 1926, providing for the donation of the lands within the specified boundaries to the United States in fee simple.

Mammoth Cave National Park in Kentucky, was established on May 22, 1936, for administration and protection only, upon acceptance by the Secretary of the Interior of fee simple deeds to 24,538 acres, surface right deeds to 4,185 acres, and cave rights to 635 acres. World-famous since its discovery, believed to have been about 1797, Mammoth Cave proper was operated under private ownership until 1930 when it became the property of the State of Kentucky. Establishment of the Mammoth Cave National Park was authorized by act approved May 25, 1926.

LAND CHANGES IN EXISTING MEMBERS OF SYSTEM

Net increases to the national park and monument system through adjustments of boundaries of existing areas amounted to 9,595.579 acres, as follows:

Acadia National Park, Maine.—Donation of 1,452.417 acres and transfer of 25.96 acres to the jurisdiction of the Navy Department resulted in increasing the total acreage of the park to 15,408.907 acres.

Blue Ridge Parkway, Va.-N. C.—Donations of 2,365.84 acres of land, all in North Carolina, were made for the purpose of making possible the construction of the Blue Ridge Parkway, to connect the Shenandoah and Great Smoky Mountains National Parks.

Chickamauga and Chattanooga National Military Park, Tenn.-Ga.—Donation of approximately 3,000 acres increased the total area to approximately 8,533 acres.

Colonial National Historical Park, Va.—Acquisition of 1,900.47 acres through donation and purchase resulted in a total area of 6,150.499 acres. The status of Colonial was changed from that of a national monument to a national historical park by act of Congress approved June 5, 1936.

Craters of the Moon National Monument, Idaho.—Elimination by act of Congress of 480 acres left the total area at 49,121.90 acres. The lands were eliminated to round out the natural boundaries of the monument and to facilitate administration in connection with grazing.

Great Smoky Mountains National Park, N. C.-Tenn.—Acquisition by donation and purchase of 794.95 acres brought the total area of this park to 394,883.30 acres.

Kings Mountain National Military Park, S. C.—A donation of 40.09 acres of land, the first to be acquired, was made to the United States for this park.

Morristown National Historical Park, N. J.—Donation of 4.06 acres resulted in a total area of 957.44 acres.

Rocky Mountain National Park, Colo.—By proclamation of March 5, 1936, 1,832 acres were added to the park, making its total area 259,412.832.

STATUS OF NATIONAL PARK AND MONUMENT PROJECTS AUTHORIZED BY CONGRESS

Big Bend.—Establishment of this proposed park was authorized by act of Congress, approved June 20, 1935, with the provision that all lands needed therefor be donated to the Federal Government. At that time an invitation was extended to the Mexican Government to cooperate by establishing a park on the Mexican side, the two to form an international park. The idea appealed to the Mexican Government and a joint survey of the area was made by commissions appointed by the two Governments, and tentative boundaries agreed upon. These include some 800,000 acres in Brewster County, Tex., and 700,000 acres in the Mexican States of Chihuahua and Coahuila.

Isle Royale.—An allocation of \$705,000 from an emergency appropriation was made for the acquisition of lands within the area of the proposed Isle Royale National Park in Michigan, on which to provide work for C. C. C. camps. Two such camps have been at work reducing fire hazards and making limited improvements. These activities have been carried on in cooperation with the Department of Conservation of the State of Michigan.

Everglades.—The Everglades National Park Commission, appointed by the Governor of Florida, is preparing a program to acquire the necessary lands for conveyance to the United States Government. Legislation passed at the last session of the Florida Legislature provides that State lands outside the park may be traded for privately owned lands within the park area.

Badlands.—The establishment of this monument under the terms of the authorization of Congress approved March 4, 1929, is contingent upon acquisition by donation of the private lands and upon the construction by the State of an approach highway. The State of South Dakota has completed the highway and has purchased a portion of the private lands within the authorized boundary. On June 26, 1936, the President approved an act authorizing an extension to include certain lands adjacent or contiguous to the Badlands National Monument project, providing the entire monument area does not exceed 250,000 acres.

Ocmulgee.—This national monument was authorized by Congress in 1934 to preserve Indian mounds of great historical importance, contingent upon the donation of the lands involved to the United States. Through the efforts of local citizens of Macon, Ga., a total of 514.88 acres is contained in the four deeds which have already been accepted.

NEWLY AUTHORIZED PROJECTS

During the fiscal year Congress approved the establishment of the following 11 park and monument areas, contingent upon the acquisition, by donation, of the necessary lands:

Ackia Battleground National Monument, Mississippi.
 Andrew Johnson Homestead National Monument, Tennessee.
 Appomattox Courthouse National Historical Monument, Virginia.
 Fort Stanwix National Monument, New York.
 Fort Frederica National Monument, Georgia.
 Homestead (Daniel Freeman) National Monument, Nebraska.
 Patrick Henry (Red Hill) National Monument, Virginia.
 Perry Victory and International Peace Memorial National Monument, Ohio.
 Richmond National Battlefield Park, Virginia.
 Spanish War Memorial Park, Florida.
 Whitman National Monument, Washington.

PROPOSED ADDITIONS TO THE NATIONAL PARK SYSTEM

Studies of areas of potential value as national parks and national monuments, and of desirable extensions to areas already acquired, were continued during the year. The importance of this work has been emphasized in the past few years by the need shown for a thorough plan of use of our natural resources, including recreational-land use.

At the beginning of the fiscal year, 224 active projects were on the Service's list of areas to be investigated as of possible national park or monument caliber. Preliminary investigations of many of these areas during the year resulted in a reduction in the list to 156 active projects. Some of these require further studies and others are awaiting investigation. The major park and monument projects pending before the Service, which received consideration or action during the past year, follow:

Grand Teton extension.—With the close of the Seventy-fourth Congress, another bill (S. 2972) for the extension of the boundaries of the Grand Teton National Park, Wyo., failed of passage because of the complexities surrounding the situation, both as to public and private interests. No hearings were held by the Senate Committee on Public Lands and Surveys upon the bill, and the amendments pro-

posed thereto by the Department of the Interior. The Department of Agriculture reported adversely upon the proposed legislation.

As introduced, the bill covering the proposed extension did not include Jackson Lake Reservoir. Careful consideration by this Service compels the conclusion that Jackson Lake Reservoir, together with a small area to the eastward, embracing Emma Matilda and Two Ocean Lakes, must be included in the extension. The Teton-Jackson Hole area is a great natural and recreational unit. Jackson Lake Reservoir lies at the base of the Teton Range. Some of the finest views of the Tetons are mirrored across it. The protection of its entire shore line from further scenic impairment and of the nearby roadway is of vital importance to the park project. The willow thickets, marshes, and cluster of lakes east of Jackson Lake are famous grounds for moose, otter, beaver, and wild fowl.

Extension of the boundaries of the park as provided in S. 2972, with the amendments proposed by the National Park Service, is necessary to provide a proper setting for, and approach to, the magnificent mountain range within the present park.

Proposed Kings Canyon National Park.—S. 2289, to establish the Kings Canyon National Park, Calif., also failed of passage in the Seventy-fourth Congress.

The Kings Canyon region is one of the superb, unspoiled scenic areas of our country. Ever since the days of John Muir, there has been constant effort to save this scenic portion of the Sierra Nevada from the ordinary forms of commercial exploitation permitted in a national forest reservation. Previous attempts to establish the Kings Canyon National Park have failed because of possible future commercial values of the area. It is evident, however, that with the recent development of additional hydroelectric power at Boulder Dam and elsewhere throughout the State, the power resources of the upper Kings Canyon watershed are not essential to the economy of the State. The proposed boundaries would exclude from the park the most valuable reservoir sites as well as the major portion of the essential grazing lands and hunting territory.

With the construction of a State highway into the Kings Canyon, the problem of conserving unimpaired the superlative scenic qualities of the area has become one of major importance. It is believed that national-park status would provide the only appropriate form of land use for the Kings Canyon region, which is one of the most important remaining areas in Federal ownership not yet added to the national-park system.

Proposed Mount Olympus National Park.—Exhaustive hearings were held by the House Committee on Public Lands on H. R. 7086, introduced in the previous session to establish the Mount Olympus

National Park, Wash., which would include the existing Mount Olympus National Monument. The committee reported the bill without amendment and with the recommendation that it be passed, but it failed in the closing days of the last session of Congress.

The purpose of the proposed national park is to preserve for the benefit and enjoyment of the people, the finest example of primeval forest in the Pacific Northwest; to provide suitable range and permanent protection for the herds of native Roosevelt elk and the other native wildlife of the area; and to conserve and render available to the people, for recreational use, these outstanding expressions of nature in addition to the magnificent mountain scenery and numerous glaciers of the Olympic Range.

The lands outside of the present monument, which it is proposed to include within the national park, are at present within the Olympic National Forest and are administered by the Department of Agriculture, subject to the logging practices of the United States Forest Service. Many of the trees within the proposed park area are centuries old and cannot be replaced once they are cut down. By giving the area national-park status, these trees would be saved from logging and would be made available for the inspiration of the people. The Department of Agriculture reported adversely upon the project.

The effect of the hearings on the bill proposing establishment of the Mount Olympus National Park, and the discussions generally, was to focus attention upon and to determine the appropriate use and proper administrative responsibility for an area of national-park quality.

Grand Canyon extension.—A bill (H. R. 12081) was introduced in the second session of the Seventy-fourth Congress which would abolish the Grand Canyon National Monument and add approximately 57 percent of its area to the Grand Canyon National Park. The remaining area of about 118,000 acres of private and public land is valuable principally for grazing and farming. No action was taken on the bill.

Hawaii extension.—The extension to the southeast of the Kilauea-Mauna Loa section of the park would provide for the inclusion of a shore-line section and might even insure the perpetuation of one of the few unspoiled native villages that remain on the islands. To accomplish this extension, H. R. 12306 was introduced in the second session of the Seventy-fourth Congress. No action was taken on the bill.

Hot Springs extension.—Public, No. 684, approved June 15, 1936, provides for a minor extension to Hot Springs National Park so that adequate entrances may be developed.

PROPOSED NEW NATIONAL MONUMENTS AND IMPORTANT
MONUMENT EXTENSIONS

National monument projects within the public domain.—Within the public domain in Colorado, Utah, and Arizona, are five proposed monuments containing unusual scenery, valuable archaeological relics, outstanding examples of erosion, and other exhibits of earth forces, in addition to an interesting assemblage of native plant and animal life. National monument status has been proposed as the most suitable and profitable use to which the areas in question could be put, as the lands involved are sparsely inhabited and apparently low in range productivity, mineral content, and in other commonly accepted commercial resources.

Two of these, the Kofa Mountains and Organ Pipe Cactus projects in southern Arizona, have been cleared through the Department of the Interior. Suitable wildlife protection for these two areas, together with the Green River area mentioned below, is planned in cooperation with the Bureau of Biological Survey of the Department of Agriculture. Should these monuments be established, it is expected that wildlife refuges will be established simultaneously with, and continuous to, them.

Public hearings were conducted by the Division of Grazing and the National Park Service, in cooperation with representatives of various interests in Colorado and Utah, for the purpose of solving various grazing problems connected with the other three public-domain monument projects—the Green River (which would include the present Dinosaur National Monument), the Escalante, and the Kolob Canyons areas. It is hoped that these deliberations will provide a fair and equitable adjustment of all interests concerned so that the proposed national monuments may be established.

Death Valley extension.—Five small extensions of the Death Valley National Monument, Calif., to include important springs and to provide a more complete geographic, biotic, and administrative unit, are under consideration. Approval has been obtained from the individuals and organizations that would be most intimately affected by the proposed boundary adjustments.

Wupatki extension.—Since the establishment of the Wupatki National Monument in Arizona, a dozen years ago, to preserve certain outstanding ruins on two segregated areas, investigations have revealed the presence of nearly a thousand other prehistoric ruins in the surrounding region. The plan to extend the monument to include an area of approximately 52.55 square miles for the protection of these newly investigated archeological sites already has cleared through the Department of the Interior, and the Santa Fe Railroad Co. has generously offered to donate certain sections of the territory involved.

PLANNING AND CONSTRUCTION ACTIVITIES

Prosecution of work under the various emergency programs throughout the fiscal year continued to place a heavy burden upon the engineering and landscape architectural staffs of the Service. In addition to the work carried on throughout the national park and monument system, including the National Capital Parks, the National Park Service through its technical representatives supervised similar work in State and local park areas, and recreational demonstration and Works Progress Administration projects in various regions.

The principal planning and engineering activities of the 12-month period, ended June 30, may be classified under four large programs: the Public Works program, the Emergency Conservation Work program, the Interior Department Appropriation Act for road and trail construction in national parks and monuments, and the Works Progress program.

Under the Public Works program, all general development, engineering, architectural, and landscape plans for \$12,000,000 worth of general physical improvements were prepared; and plans for and inspections of road and trail projects totaling \$27,000,000 in value were carried out in cooperation with the Bureau of Public Roads.

Similar service was rendered by the engineering and landscape personnel under the Works Progress program, which included physical improvements, recreational developments, road and parkway surveys and construction, and land utilization, to the total extent of \$3,500,000; and also in connection with Emergency Conservation Work camps in Federal and State areas.

Many projects planned during the preceding fiscal year entered the construction stage in 1936, and many were completed during the year. The experience gained during the previous year, and the stabilization of the engineering, landscape, and architectural staffs, made possible the production of the best results in the most efficient and economical manner.

Preparation of master plans for the national parks was continued as part of the program of advance planning, to embody present and future physical development of national-park areas in both graphic and written form. Twenty-eight new master plans were prepared during the year, making a total of 71 master plans now available for national-park areas.

Federal construction projects, in addition to highway and parkway work handled for the National Park Service by the Bureau of Public Roads, included such varied types of work as the structural design and technical specifications for improving or constructing buildings, minor roads and trails, electric elevators, dam and intake structures,

wharves, docks, sea walls, reservoirs, pumping plants, water supply and distribution plants, drainage systems, sewerage systems and sewage-disposal plants, telephone and power lines, cribbing bridges, retaining walls, and similar projects. In addition, considerable surveying and mapping of both old and new park areas were accomplished.

Careful study also was made of all plans and locations for road work by the Bureau of Public Roads and of all locations and designs for physical improvements by the park operators in connection with the furnishing of accommodations to visitors. An increase in this latter phase of the work was noted during the year, reflecting improved travel conditions.

PARK-ROAD DEVELOPMENT

The large allotments of Public Works funds and Emergency Relief Act appropriations for park and monument roads and trails allowed the continuance of the reconstruction and relocation of park roads to elevate them to the standards necessary for the concentrated travel reaching them from transcontinental and other approach highways.

Through an interbureau arrangement the Bureau of Public Roads, under the direction of its chief, Thomas H. MacDonald, continued its excellent cooperation in the construction of all major roads in areas administered by the National Park Service, except Mount McKinley National Park, where the Alaska Road Commission continued its satisfactory road program.

In order that the Government's investment in replacing outmoded roadways with modern systems of roads be protected, it is imperative that a well-organized program of road maintenance be adopted. Study of this maintenance problem is being initiated, the resultant reports to serve as a basis of estimating the cost of a 6-year road-maintenance program.

PARKWAY PROJECTS

The new type of development—that of connecting widely separated areas by parkways—made marked progress during the year. Two large-scale projects were continued, the Blue Ridge and the Natchez Trace Parkways.

On the Blue Ridge Parkway project 13 sections, totaling 120 miles, and three bridge projects were placed under contract, obligating approximately \$4,500,000 of Public Works funds. Development of two recreational areas along the parkway under Works Progress Administration funds was also started. Location work and right-of-way development plans were carried forward as were also preliminary planting plans. The actual construction of the parkway is carried on by the Bureau of Public Roads.

The Natchez Trace Parkway project was allotted \$1,500,000 of Works Progress Administration funds and plans were prepared and submitted to the State for more than 25 miles of right-of-way acquisition. Contract drawings for these sections were 50 percent complete by the end of the fiscal year.

Field reconnaissances and studies were made of a parkway to connect the Shenandoah National Park and the Blue Ridge Parkway with New England; an extension of the Mount Vernon Memorial Highway to Wakefield; and parkway connections between Washington and Gettysburg, and between Great Falls and Harpers Ferry.

HISTORIC AMERICAN BUILDINGS SURVEY

The Historic American Buildings Survey successfully continued field operations and moved into its third year of cataloging, measuring, and recording early American structures in the United States and possessions. When the works program of the Emergency Relief Administration closed in December 1935, over thirteen hundred structures had been fully measured and recorded; thousands of Survey drawings had been reprinted for architectural and historical libraries; and universities and private architects were adding to the collection by contributions. In January 1936 the Works Progress Administration incorporated the Historic American Buildings Survey in its Federal professional and service program under the technical direction of the National Park Service. At the end of the fiscal year a compilation of accomplishments showed that a total of 2,000 structures had been recorded in 12,000 drawings and 14,000 photographs for all programs.

RADIO COMMUNICATIONS IN PARK ADMINISTRATION

Radio communication continued to be of the utmost value in fire fighting and observation, and also in park administration. Early detection of fires, quick control, and direction of fire-fighting forces by means of the radiotelephone each year save from destruction forest areas, the scenic and physical value of which are many times greater than the cost of installing and operating this means of communication.

Radio sets have been added to the radio-communication systems of a number of the parks to meet the increasing communication demands of administration and protection.

HISTORICAL AND ARCHEOLOGICAL DEVELOPMENTS

The fiscal year 1936 saw great strides made in the expansion and coordination of the historical and archeological programs. Establishment of a branch of historic sites and buildings on July 1, 1935

was followed by the enactment, on August 21, of legislation "to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance."

Inasmuch as provision for civil-service personnel in connection with the new branch included only three additional employees, it was necessary to supplement the staff with Emergency Conservation Work personnel. Civil-service examinations for positions in the field of history and archeology have been offered, however, looking toward the establishment of a more permanent staff.

The passage of the historic sites legislation makes possible, for the first time in the history of the United States, a broad program of study and preservation of historic resources throughout the country. The act authorizes the Secretary of the Interior, after necessary investigations have been made, to designate as national historic shrines those historic and archeologic sites possessing exceptional value in commemorating or illustrating the history of the United States. Provisions were made for cooperative agreements with States and with local and private agencies in the development and administration of historic areas, regardless of whether or not titles to the properties were vested in the United States. Although funds for the purchase and restoration of historic properties are contingent on congressional appropriations, it is expected that contributions made through the national-park trust fund, established by act of July 12, 1935, will greatly increase the working capital available.

To assist in the formulation of this program, the Historic Sites Advisory Board was created, composed of eminent authorities in the fields of history, archeology, and architecture. Its membership now includes Mr. Edmund H. Abrahams, Dr. Herbert E. Bolton, Dr. Hermon C. Bumpus, Mrs. Reau Folk, Hon. George de Benneville Keim, Dr. Alfred V. Kidder, Dr. Fiske Kimball, Dr. Waldo G. Leland, Mr. Archibald McCrea, Dr. Frank R. Oastler, and Dr. Clark Wissler.

The Advisory Board in meetings held on February 13 and May 7 crystallized procedure for the acquisition and designation of national historic sites and formulated policies for cooperation with other governmental agencies. A list of type sites, illustrating important phases in the history of the Nation, was submitted with specific recommendations for the Board's consideration. Favorable action was proposed by the Board and approved by the Secretary of the Interior on Derby Wharf and vicinity, Salem, Mass.; Harpers Ferry, W. Va.; and Old Main Building, Knox College, Galesburg, Ill.

State cooperation in the national program is shown by the proffered transfer from the State of Virginia to the Department of the Interior of the Civil War battlefields near Richmond; the donation of Fort Stanwix by the State of New York; and an appropria-

tion of \$50,000 by the Massachusetts Legislature for the purchase of property to be included in the proposed Derby Wharf national historic site in Salem, Mass. Similarly, properties have been contributed by other Government agencies, such as the site of Lord Fairfax's mansion, "Belvoir", by the War Department, and the customhouse in Salem, Mass., by the Treasury Department. Provisions for the gradual retirement of the Perry Victory Memorial Commission emphasizes the marked tendency to coordinate the responsibilities of restoration and preservation under a single administrative unit.

The National Park Service participated in an important way in the planning and development of several interesting State historical projects in cooperation with State historical societies, conservation commissions, and planning boards. These included the preservation of such places as Hopewell Furnace, colonial iron-making village in Pennsylvania; Fort Frederick, masonry fortification surviving the French and Indian War, in Maryland; Fort Macon, imposing seacoast defense in North Carolina; Moundville, Ala., one of the outstanding archeological sites of the southeast; and two mission restorations in the southwest. These projects mark an important step forward in cooperation between the National Park Service and the various States in the preservation of interesting sites which it would not be possible for the Federal Government to own and control.

Last year's annual report carries mention of the legislation providing for an appropriation of \$50,000 with which to make a survey of the old Indian trail known as the Natchez Trace, with a view to constructing a national road on this route to be known as the Natchez Trace Parkway. Studies on the authentic location and history of the trace were made and incorporated in the Natchez Trace, an Historical Survey, completed August 1935. Plans for the publication of this report are now under way.

Particularly significant was the extension of the expanded historical program into the area west of the Mississippi River, involving new and additional attention to the historical and educational aspects of the western national park areas, including the archeological sites in the Southwest. Investigations were made of a number of important sites representing significant phases in the history of the West, in particular those associated with the founding and growth of Oregon, Washington, and California. Within the regular scope of historical operations has been brought such work as the restoration of Mission Espiritu Santo at Goliad, in Texas, and of Mission La Purisima, near Santa Barbara, Calif. A number of western forts, such as Fort Lincoln, N. Dak., associated with Custer, Fort Sisseton, in

South Dakota, and Fort Ridgely, in Minnesota, have been the subject of planning and development.

Celebration of the fiftieth anniversary of the dedication in 1886 of the Statue of Liberty, now administered as a national monument, has stressed commemoration of its spiritual significance on a Nation-wide and all-year basis. Many leading national organizations have responded by carrying on programs keyed to the interest of their local units. Three such organizations have sponsored national contests and one an international contest.

Except for the reenactment of the dedication planned for October 28, 1936, in which it is expected the President, the Secretary of the Interior, and the French Ambassador will take part, no ceremonies are being held at the statue.

As facilities, such as administration and museum buildings, contact stations, roads, trails, markers, and shelters, have been completed through Public Works and Emergency Conservation Work Programs in eastern national historical areas, and as the literature, ranger-historian service, and museum exhibits—the product of 3 years of intensive work—have reached the stage of complete functioning, the system of national military areas has come to be one of the outstanding general groups of historical exhibits in the world.

NATURALIST ACTIVITIES

Many gains were made in the naturalist program to afford opportunities to the visitor for understanding and appreciating the natural features of the parks. Activities along this line were modified or augmented, as indicated advantageous by past experience. The effort to secure more mature men as ranger naturalists resulted in improvement in the program, as it has been demonstrated that men just out of college lack the background necessary for efficient nature guides and lecturers. All the major parks now give special training to newly appointed rangers and naturalists, and in some parks the bus drivers employed by the transportation lines are given similar training, to improve the type of information furnished to the visitor.

As in other lines of national-park endeavor, emergency personnel made possible extended improvements in educational service to the public. Emergency Conservation Work, Works Progress, and National Youth Administration programs all afforded assistance, especially in the field division of education which is located at Berkeley, Calif. The Berkeley headquarters also benefited for a short time by the State emergency relief administration program.

The staff of wildlife and geology technicians appointed to make careful check of Civilian Conservation Corps activities, for the pur-

pose of preventing injury to scientific features and of developing important research programs productive of basic information essential to judicious planning, was expanded to meet current needs.

An outstanding measure of cooperation was the award to the National Park Service of a Yale graduate fellowship for the year 1935-36, to be filled by a regular employee desiring to improve his ability by further graduate training unhampered by any specified curriculum. Park Naturalist Frank Brockman, of Mount Rainier National Park, filled the assignment most satisfactorily. This award has again been made available to a National Park Service employee for 1936-37. Such action on the part of Yale University is a stimulus to the park-naturalist staff to attain high standards of training and efficiency.

Transfer of the volcano observatory, in Hawaii National Park, and its volcanologist, Dr. T. A. Jaggar, from the United States Geological Survey to the National Park Service was effected on July 1, 1935. Dr. Jaggar, internationally known for his contributions to volcanology, has been in immediate charge of the observatory since its establishment in 1912. At the request of the Royal Society of London, Dr. Jaggar was detailed for 2 months to Montserrat, West Indies, to study the seismism of that island.

In the national parks the demand for educational aids continues unabated, as evidenced by attendance records and sales of publications. Contacts with various naturalist educational facilities passed the 3,000,000 mark. It is interesting to compare this figure with the 48,156 educational contacts reported in 1920, the season during which naturalist activities were first inaugurated.

The operation of guided trips to the glaciers and summit of the mountain by company employees for a fee, whereas trips conducted by park naturalists are free, long has presented a difficult problem in Mount Rainier National Park. In order that uniform service may be furnished in all parks, recommendation has been made that the Government take over and operate all guided trips in that park.

Great improvement is to be noted in the facilities for evening gatherings of campers. Fine new outdoor amphitheaters have been constructed in Rocky Mountain, Sequoia, and Zion National Parks.

NATURAL HISTORY SCHOOLS

The Yosemite School of Field Natural History opened for its eleventh session in the summer of 1935 with a group of 20 students from some 10 States in attendance. The class contained 14 men and 6 women, selected from approximately 70 applicants. The twelfth session convened June 22 and is now hard at work on its 7-week course. This school is becoming better known throughout the coun-

try, and men and women of higher background of training and experience are applying for entrance. Three men of the 1935 class held degrees as doctors of philosophy.

The junior nature school in Yosemite opened for its sixth season at the end of June 1935. The increase of interest and worth-whileness of this effort were shown in the daily attendance. In 1934 there was an average of 81 children per day in attendance, while last year the average during the first week was 125 per day. The seventh session, now in progress, commenced June 29.

The fifth annual volcano session of the University of Hawaii summer school was held in the summer of 1935 at the Volcano House in Hawaii National Park. Nine courses of study were offered by 6 instructors and 84 students were registered. The instructors in the volcano session again cooperated with the national-park staff in putting on a series of evening lectures, and the naturalist service contributed to the instruction work.

LIBRARY DEVELOPMENTS

Libraries in the parks continue to grow. It is a pleasure to report considerable activity in improved housing and in classifying and cataloging. All books in the Washington office have been carded and indexed. A trained librarian has brought the Sequoia library into proper working condition. Hawaii has added more than 500 cards. It can be reported that practically all reference libraries have added many items through purchase and donation and have improved their catalogs. A special committee on national park libraries continues to function under the American Library Association

NATURAL HISTORY, MUSEUM, AND LIBRARY ASSOCIATIONS

In most major parks a natural history or museum and library association has grown up as a helpful organization able to finance and promote the educational and research program in a park in ways not open in Government operation. Legal status for such nonprofit organizations has now been procured and their positions materially strengthened, making possible additional programs of this type.

SCIENTIFIC RESEARCH AND DISCOVERIES

Much valuable information was gathered in the parks as the result of cooperation with other scientific agencies and institutions, such as the United States Geological Survey, Carnegie Institution of Washington, and National Geographic Society. Dr. N. E. A. Hinds, of the University of California, continued his study of Algonkian rocks in the Grand Canyon, and studies of the Archean rocks were continued by Drs. Maxson and Campbell, of the California Insti-

tute of Technology, who examined new areas by means of a boat. Glacial movements were recorded in cooperation with the International Geophysical Union. Dr. H. E. Gregory conducted geological studies in Bryce Canyon. Dr. Levi Noble continued research studies in Death Valley National Monument, which contains a myriad of complex geological examples. Dr. Howell Williams, under a grant from the Carnegie Institution of Washington, began a thorough study during the summer of 1936 of the volcanology of Crater Lake National Park. Dr. Warren D. Smith, of the University of Oregon, and Dr. David Griggs, of Harvard University, also conducted studies of the geological features of this park. Dr. Erzsebet Kol, privatdocent of botany, Szeget, Hungary, under an award from the International Federation of University Women, is making a study of the algae causing pink and green snow and is planning to visit the western parks and Alaska where these algae, living in snow, might be found.

Summer field parties were sent to the national parks by the International Geophysical Union, Princeton University, Clark University, California Institute of Technology, Western Research University, University of Colorado, Transsylvania College, Miami University, and Mississippi State College.

In addition many other geological activities were carried on, as reported in the following section.

ENLARGED GEOLOGICAL PROGRAM

Through the appointment of 21 geologists under the Emergency Conservation Work organization it was possible to work out programs for the preservation of the geological features of the national parks and monuments; to prepare descriptive material and make recommendation for trail locations which will lead to the appreciation of these features by the public; and to furnish technical advice concerning problems of economic and engineering geology pertaining to the emergency program.

An outstanding result of the work of these geologists was the preparation of 35 detailed geological reports on existing and proposed National and State park areas, 284 brief summaries of the geology of such areas, and 60 reports on specific developmental projects.

Among the notable achievements of geologists on the Service staff not previously reported were the following:

1. Excavation project at Fossil Cycad National Monument, revealing the presence of hundreds of specimens in place, justifying the retention of the area by the Federal Government as part of the national park and monument system.

2. Discovery of a new habitat of prehistoric man in the Longhorn Caverns State Park, Tex.

3. Excavation, under the guidance of geologists of the National Park Service, of fossil dinosaur skeletons at the Dinosaur National Monument. This exhibit, when completed, will not only show the bones in place but will contain reconstructions of these ancient monsters.

4. Discovery at the Petrified Forest National Monument of a stump and root system, about 15 feet in length, of a petrified tree entombed in a vertical position with leaves and cycad cones buried at its base. This, together with smaller samples unearthed, indicates that some of the trees grew within the boundaries of the present national monument, contrary to the older theory of growth elsewhere and drift.

5. Development of fossil exhibits on the Kaibab and Bright Angel Trails in the Grand Canyon, showing examples of extinct plants and animals in situ.

6. Display of fossil ginkgo trees, found entombed in lava flows of the Northwest.

7. Formation of a policy regarding cave development designed to prevent overdevelopment and consequent injury to cavern features of the parks.

8. Accumulation of geological evidence, which will be submerged by completion of Boulder Lake, for museum display.

9. Operation of seismograph at Lassen Volcanic National Park taken over by National Park Service.

10. Preparation of 6 reels of talking motion pictures illustrating general geological processes, and of 10 relief models showing the glacial history of New York State, and collection of geological specimens for museum and trail-side display.

New discoveries of geological data are being constantly made, the full value of which can be determined only as the investigations proceed.

COOPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY

Arrangements were consummated with the United States Geological Survey for the assignment of some of its especially trained geological personnel to the study of specific problems, some of which are listed below:

1. Glacial history of Sequoia and Yosemite National Parks, now being studied by F. E. Matthes.

2. Reconnaissance of proposed Big Bend Park area made by C. P. Ross.

3. Problems of shore-line erosion and sand fixation at the Cape Hatteras State Park, investigated by C. Wythe Cooke.

4. The services of Dr. Herbert E. Gregory obtained for a reconnaissance geological investigation of the Colorado Plateau area and to report specifically on all areas in the region in which the National Park Service is interested.

MUSEUM DEVELOPMENTS

Interpretation of certain phases of the American scene by the museum method constitutes an enterprise of enormous proportions. With emergency funds as the structural foundation for expansion, museums in national parks made significant strides in 1935 and 1936. Prior to allotment of Public Works funds there existed 27 museums in 21 areas administered by the National Park Service; there are now 53 museums in 44 national parks and monuments. More than 70 percent of the allotment was expended in employing workers on these projects. The four central laboratories at which the preparation work for these museums is done are located at Berkeley, Calif.; Morristown, N. J.; Fort Hunt, Va.; and Washington, D. C., and are largely operated by Emergency Conservation Work and Works Progress funds.

In order to achieve a concerted representation of needs of the museums, a definition of responsibilities and confirmation of stated relationships of the Museum Division were executed on December 2, 1935. This centralization of museum duties gave the group concrete classification and embodied the various National Park Service museum activities into a closely allied unification of work.

During the year exhibit plans were completed, approved and placed in work for Vicksburg, Shiloh, and Chickamauga-Chattanooga National Military Parks, Hot Springs National Park, and Colonial National Historical Park in the East.

For the West exhibit plans were drawn up and approved for museums in Aztec Ruins, Bandelier, and Devils Tower National Monuments, and Rocky Mountain (Fall River Pass), and Wind Cave National Parks. In addition, considerable work has been accomplished in connection with plans for State park museums.

Each museum is designed to meet a special need. The exhibit schemes, devised by historians, curators, and artist preparators, limn in skillful and dramatic manner a story of particular portent in Americana. The old ideal of curios and scientific collections is left behind, and in its place is a careful series of devices charged with dynamic facts for minds peculiarly receptive to informational impulses at the time.

Another major project is the museum for the new Interior Department Building. The contents of the exhibits will have the speci-

fied result of delineating, in vivid and artistic style, the manifold relationships of the various departmental bureaus to the citizen in the course of his life.

This year saw an ever-increasing demand for National Park Service exhibits to find place in expositions. Among the more important expositions accommodated were the Texas Centennial, San Diego Exposition, and the Great Lakes Exposition.

WILDLIFE PROTECTION

Biologists of the National Park Service during the year participated actively in many conservation meetings, notably the North American Wildlife Conference and affiliated State wildlife federation meetings, meetings of the American Fisheries Society, American Ornithologists' Union, and the American Society of Mammalogists, State Civilian Conservation Corps educational advisers' conferences, and various conferences of State game officials and sportsmen's organizations.

The restoration of wildlife has been greatly aided by conservation measures taken through the Emergency Conservation Work organization. Wildlife sanctuaries have been rebuilt and streams restocked with fish, and numerous rearing pools built by the Civilian Conservation Corps enrollees in cooperation with Federal and State organizations.

A number of biological research projects, mostly to evolve practical management plans, were undertaken or continued. The study of bighorn, its habits and status, was continued in western parks and monuments. A faunal survey was made at Lava Beds National Monument with recommendations for extension of boundaries to insure protection to native fauna as well as to archeological material. At Mount Olympus National Monument the life histories of deer, elk, and cougar were studied. The Yosemite National Park pack and saddle horse range problem has been studied, and recommendations were made for future management to avoid undue competition with wildlife. An intensive study of the flora of Great Smoky Mountains National Park has continued. Already, some 3,000 plant specimens, representing approximately 2,000 species, have been collected in the park. Investigation of the fauna and flora of the Big Bend National Park project occupied the time of two observers for a month; this research is being continued during the present field season with special emphasis on the plants and mammals. Many other studies have been made, including winter deer foods of Wilderness State Park, Mich., the ivory-billed woodpecker in central Louisiana, birds of White Sands National Monument, N. Mex., coat colors of three squirrels of the Grand Canyon region, amphibians of the Great Smoky Moun-

tains, and deer and caribou of northern Minnesota. Results of some of this research have been published in technical and scientific journals. A bird and mammal check list was in course of preparation for all the national parks in the United States and Alaska, the section dealing with birds being brought practically to completion.

Research areas for the study of native biota have been established in Great Smoky Mountains National Park. At Sequoia reserves have been set up for the preservation of the fisher and golden trout. A research area at Pinnacles National Monument will give special protection to, and facilitate scientific study of, the duck hawk and other nesting raptorial species of birds in the monument.

ACTIVITIES IN FISH CONSERVATION

A very definite fish cultural policy for the national park system was developed. This policy conforms with the general policy of the national parks, which emphasizes the importance of perpetuating native fauna, and will also tend to improve fishing in park waters. Native species will be protected from the introduction of exotics in all waters where the latter have not already been planted, and will be favored in all other park waters where they are of equal or superior value from the standpoint of fishing.

Surveys have been made of many lakes and streams of national parks and monuments and the data filed for future use in restocking programs. A major activity of the supervisor of fish resources has been in connection with exploration of sites for a proposed hatchery for Glacier National Park, for which an allotment of funds has been made. Technical advice on fish problems, especially the elimination and prevention of future ingress of exotic species of fish in Yellowstone National Park, has been given administrative officers of the various areas.

During the past year, nearly 60,000,000 trout eggs were collected within the national parks. About 50 percent of the fish hatched from these eggs were distributed to waters of various States. Increased fishing demanded increased planting and, accordingly, over 30,000,000 fish were planted in national parks and monuments. A hatchery building was constructed at Great Smoky Mountains National Park, together with rearing ponds for the propagation of trout. Full cooperation has been given by the Bureau of Fisheries and State game and fish departments.

ANIMAL REDUCTION PROGRAM

It was necessary to carry out the reduction of elk for a second year in Yellowstone National Park and vicinity during the winter of 1935-36, and 2,933 head were removed from the northern range.

This work was undertaken by the park staff with the full cooperation of the Montana Fish and Game Commission. Hunting was allowed in Park County, Mont., and over 2,000 elk were killed by hunters. Some deaths occurred from natural causes or accident, but most of the remainder were live-trapped and shipped to Indian agencies and the Idaho State game department. After the reduction had been accomplished, a census of elk in the northern Yellowstone herd showed that there was a total of 10,281 animals remaining on the range.

In accordance with the established policy to maintain the number of bison of Yellowstone National Park within the carrying capacity of their range, 109 were removed alive. Ninety of these were shipped to the Crow Indian Agency and 10 to the Pine Ridge Agency for restocking purposes, and the remainder were sent to zoos.

SANITATION IN THE PARKS

Continued efforts were made, in cooperation with the Public Health Service, to safeguard the health of the nearly 8,000,000 visitors to the national parks and monuments through the installation and operation of proper sanitary facilities and the inspection of all such facilities to guard against inadequacy and deterioration.

In the main, the largest sanitary problems, particularly in connection with water-supply development and sewage disposal, have been solved; but constant vigilance was necessary to maintain the requisite health standards.

As last year, the greatest sanitary problems were presented in the newer eastern areas. In the newly established Shenandoah and Mammoth Cave National Parks, studies were made and plans drawn up for sewage-disposal projects and for the development of water supplies. Inspections and plans also were made for similar facilities in some of the eastern military and other historical parks; the special problems, such as mosquito control and study of conditions at swimming pools, were given attention.

Advice also was rendered, through Public Health Service channels, to officials associated with sanitation in State parks and Resettlement Administration areas.

PUBLICATIONS AND PUBLICITY

The situation concerning the printing requirements of the National Park Service remains much the same as at the close of the last fiscal year. Printing funds are totally inadequate to meet the demands upon the Service for the issuance of information circulars and other publications. By the close of the fiscal year the supplies of the majority of information circulars for 1936 were practically ex-

hausted, with the greater part of the summer season still ahead, to say nothing of the winter season which is assuming important proportions in national-park administration. Keen concern has been expressed by the Advisory Board, appointed under the historic-sites legislation, over the inadequacy of the printing funds available.

During the year, through the use of regular printing funds, 650,000 circulars of information for free distribution were printed at the Government Printing Office, and also a special scientific publication entitled "Plants of Yellowstone National Park", which sells for 25 cents a copy. A reprint of Research and Education in the National Parks was issued, as well as three guide leaflets on Grand Canyon National Park.

Information to the public also was augmented by the issuance of motorists' guides for Crater Lake, Mount Rainier, Yellowstone, Yosemite, and Rocky Mountain National Parks, and for Waterton-Glacier International Peace Park, for distribution to autoists in those parks.

Copy for a new publication, Glimpses of Eastern Historical Areas, was prepared, edited, and sent to the Government Printing Office shortly before the close of the year. This, when published, will be the first printed material issued by the National Park Service on the historic areas transferred to its jurisdiction under the consolidation of Federal-park activities during the summer of 1933.

Through the cooperation of the Director of Emergency Conservation Work, reprints of Glimpses of Our National Parks and the National Parks and Emergency Conservation Work were authorized and are now under way at the Government Printing Office. Another publication, entitled "Ferns and Flowering Plants of Isle Royale", also is being printed at the Government Printing Office and will probably be ready for distribution by the end of the year.

A report of the work of the Historic American Buildings Survey was printed from emergency funds available for the prosecution of the project, and a report on the elimination of pollution of Rock Creek was published with funds available for the survey of this project.

Two other publications made possible through emergency funds were Park Structures and Facilities and Recreational Demonstration Projects. The former is a signal contribution to park work generally and meets the grave need for a medium through which to communicate standards for park architecture to the many agencies called upon to initiate structural programs in parks under the Emergency Conservation Work program. Its 246 pages of photographs, drawings, and comments focus on appropriate and recommended park structural practices. Printed in an edition of only 2,350 copies, available

for distribution in November 1935 within the Service and to cooperating Federal and State agencies, it already has exerted a marked and beneficial influence on the character and practicability of park buildings over a wide area. Another edition, more comprehensive in scope, is now in preparation. The recreational demonstration projects booklet illustrates graphically, through the project at Chopawamsic, Va., the work being done in this line of emergency endeavor.

The naturalist and wildlife staffs have been unusually prolific in preparing records and comprehensive scientific papers. Publications dealing with educational activities in the Civilian Conservation Corps camps include an outline of a course on the conservation of natural resources which was furnished to the United States Office of Education and a technical circular regarding the construction of relief models, which was supplied to the camps to furnish useful employment during inclement weather and to supply a demand for relief models to be used for display purposes.

Historians of the Service, in addition to preparing material for the pending new publication, *Glimpses of the Eastern Historical Areas*, also prepared copy for seven informal leaflets on the historic areas under the jurisdiction of the National Park Service. These and a number of other small pamphlets were published by the rotaprint method through the Department's Miscellaneous Service Division and were of great aid in furnishing information to the public.

POSTERS

The poster method of calling attention to the availability of the National and State parks as vacation areas was continued, six posters being issued during the year. As in the past, only limited editions could be printed, using emergency funds. Because of the popular and educational interest in poster displays, funds for an expanded poster program should be made available.

RADIO BROADCASTS

The broadcasting program of the Service for the first time this year took the form of dramatization. Through the courtesy of the National Broadcasting Co. a series of 13 programs, covering the major western parks, was broadcast over a national hook-up during the spring months. A marked increase in the demand for park publications followed the initiation of this program.

Radio script on scientific subjects also was prepared by the Service for issuance to independent stations throughout the country indicating a desire for such script. There has been an increasing demand for this material, and a number of the independent stations also used the script of the dramatized programs. In this connection it is

interesting to note the request for copies of each of the 13 dramatized versions for use by 54 colleges.

The National Park Service also cooperated with the United States Office of Education in the preparation of scripts for broadcasts on natural-history subjects which were exemplified in the national parks, and script also was prepared in the E. C. W. regional offices of the National Park Service.

In addition, numerous officers of the Washington office and the field appeared on national and local programs by direct invitation of the broadcasting companies or of commercial programs.

Before the close of the fiscal year arrangements had been completed for the broadcasting of the dedication, on July 3, of the Shenandoah National Park by President Roosevelt and Secretary Ickes, over Nation-wide hook-ups of the two main broadcasting companies.

PRESS RELEASES AND OTHER NEWSPAPER AND MAGAZINE PUBLICITY

During the year approximately 270 statements on national-park activities were prepared in the Washington office for release to the press, either through the Secretary of the Interior or the Director of Emergency Conservation Work. These covered broad phases of national-park work or policy matters. Other matters of interest primarily sectional or local were covered in releases direct from the national parks and monuments or from the E. C. W. regional offices.

In addition, a large amount of special material was prepared by request, for publication in encyclopedias, magazines, and newspapers throughout the country, and an even greater volume of material was furnished special writers to form the basis of such articles. On an average, two or three such requests from feature writers or newspaper correspondents were received each week at the Washington office.

LECTURES

In addition to the lectures given in the national parks and monuments as part of the educational program, the Washington office arranged for a series of 14 free lectures, open to the public generally, in the Interior Department Auditorium and the new United States Government Auditorium, on subjects relating or allied to the national parks and monuments. Most of the speakers on this series were local or visiting field scientists or technical advisers on the Service staff. In addition, the National Park Service was enabled, through a cooperative arrangement, to offer to several schools and other organizations, 26 lectures on certain national parks of the southwest. Several members of the Service staff also devoted a large amount of their

personal time to giving talks on national-park subjects to schools and other organizations in and near Washington, D. C. The field for this type of service is limited only by the personnel and funds available for such work.

VISUAL EDUCATION

Visual-instruction activities, formerly administered by the National Park Service, were merged with a Department motion-picture division. Demand for photographs, films, and slides has greatly increased, and it is fortunate that the emergency program has made possible considerable additions to the film and slide library.

FOREST PROTECTION AND FIRE PREVENTION

The allotment for forest protection and fire prevention for the fiscal year 1936 under the regular appropriation permitted allotments to the parks sufficient to meet only the barest needs for fire-protection personnel and equipment. As in the preceding fiscal year, all forest protection improvements, insect and tree-disease control, and type-mapping activities were financed from the emergency appropriation. The forest-protection accomplishments of the past year are, therefore, largely represented in the report of the Emergency Conservation Work program. That program made possible a continuance of the forest-protection-development projects within the national parks and monuments far in advance of what would have been possible under normal appropriations.

FOREST-FIRE PROTECTION

The western national parks and monuments, despite adverse fire-weather conditions and greatly increased public use, established a very creditable fire record for the season of 1935. The number of man-caused fires in the western parks was the smallest recorded for any of the past 5 years, while lightning fires showed a marked increase. The total number of fires in the western parks was approximately the same as the average for the past 5 years, and the acreage burned was the least for the past 8 years. Glacier National Park, with 1,446 acres burned, suffered the most damage. This was almost entirely due to two fires—Waterton and Chief Mountain.

Incendiary fires fortunately are of rare occurrence in the western national parks and monuments, but they constitute the foremost cause of conflagrations in the eastern parks, especially in the Mammoth Cave area. This is due largely to the private lands within these eastern areas, occupied by local residents and squatters who make a practice of using fire for clearing land for cultivation and for grazing purposes. As the private land situation is cleared up in these eastern

park areas, this trouble will in all probability diminish and, it is hoped, eventually be eliminated.

Annual fire statistics for the calendar year 1935 are given on pages 149.

As a means of improving fire detection and fire dispatching, large-scale panoramic photographs were taken during the year from 110 fire lookout stations and observation points within the national parks. These photographs, with orientation marked thereon, permit the protection personnel to visualize the area in which a lookout reports a forest fire, thus affording a much better understanding of topography and cover in the vicinity of the fire.

Some much needed fire equipment was procured during the past year, including five pick-up trucks equipped with water tanks and booster pumps for use with suppression squads. There is still a great need for additional fire equipment in many of the parks, particularly for modern fire trucks equipped with water tanks, pumpers, and hose.

INSECT CONTROL

Although insect-control work has been carried on by the C. C. C. in many of the western parks and monuments, there are still numerous insect epidemics in a number of the parks. The two most threatening are the mountain-pine-beetle epidemic, which has swept from adjacent forest areas into the subalpine forests of Yellowstone and Grand Teton National Parks in such intensity that control is futile, and the needle-miner infestation in the lodgepole-pine forests of Yosemite National Park, which threatens much of the subalpine forest of that park. The Bureau of Entomology and Plant Quarantine is cooperating with the Service in carrying on investigative and experimental work for the control of the needle miner in Yosemite, and in studies and technical advice relating to insect manifestations in numerous other parks.

The situation in Yellowstone is further complicated by a very serious winterkilling of the foliage of coniferous trees over several thousand acres. Whether these trees will recover is not yet definitely known.

In the Southwest an epidemic of Ips, threatening the piñon pine, was brought under control in Mesa Verde National Park and Colorado National Monument. The Black Hills beetle, which was so destructive several years ago, has again made its appearance on the North Rim of Grand Canyon and in Bryce Canyon, as well as on the adjacent national forests, and should receive prompt attention.

Spraying to control the western tent caterpillar on deciduous trees has been continued with success in all parks and monuments affected.

BLISTER-RUST CONTROL

No new blister-rust-control projects were initiated during the past year, but control operations were continued in Mount Rainier, Acadia, and Shenandoah National Parks. The work in all three areas was accomplished by C. C. C. enrollees.

TREE PRESERVATION AND REPAIR

During the year the important trees in 10 national cemeteries, 3 national parks, 11 national military and historical parks, 2 national monuments, and 1 national battlefield-site were given complete care from the standpoint of pruning, bracing, spraying, and root treatment, and trees of greatest importance were given special cavity treatment and lightning protecting by the specially authorized E. C. W. itinerant tree-preservation crew and C. C. C. personnel. Work of a similar nature was accomplished in National Capital Parks by an allotment of P. W. A. funds. The Service published seven bulletins on several phases of tree preservation. Two additional high-powered sprayers were purchased for use at Acadia National Park for insect control. A special allotment of E. C. F. made possible a successful attack on the Morristown National Historical Park cankerworm infestation when an autogiro was used to spray a forest area—probably the first time an autogiro was so utilized.

TYPE MAPPING

For the purpose of obtaining a detailed inventory and map of vegetation of the parks for use in planning protection, development, and use of the areas, the preparation of vegetative type maps was continued. Approximately 5,596,000 acres have been mapped to date, of which 2,201,000 acres were mapped during the past fiscal year.

During the preparation of these vegetative type maps, complete herbaria of all plants found have been prepared and new plants added in the park-museum material. A detailed check list and description of plants is being prepared. Several hundred new plants have been identified. In Grand Canyon National Park alone over 200 species have been identified which had not previously been reported in that area.

FIRE PROTECTION FOR BUILDINGS

The fire-protection engineer made fire-hazard inspections of buildings at Glacier, Mount Rainer, Yellowstone, Sequoia, Yosemite, and Great Smoky Mountains National Parks. Supplementary inspections were made at Colonial National Historical Park and Gettysburg National Military Park. The review of plans for buildings and water systems with reference to fire-protection requirements was active dur-

ing the year. One of the special activities of the fire-protection engineer is a study of the accident-prevention problem which is being considered by an interbureau committee appointed by the Secretary of the Interior, of which the fire-protection engineer is chairman.

ACCOMMODATIONS FOR THE PUBLIC FURNISHED BY PRIVATE CAPITAL

The long-established policy of the Department in regard to concessions for the accommodation of the public in the national parks was continued and further developed during the 1936 season. New operators were installed in several of the smaller areas recently transferred to the jurisdiction of the National Park Service. Negotiations at the present time are under way for the granting of a concession contract to one large, well-financed operator to handle all accommodations for the public within the newly established Shenandoah National Park.

The upward trend in the business of the park operators continued. With this increase in business, further improvements in facilities were under way as the fiscal year closed. The Utah Parks Co. is replacing the fine lodge building on the North Rim of the Grand Canyon which was destroyed by fire on September 1, 1932. Changing conditions in Yellowstone National Park have rendered necessary a consolidation of four park operators, the Yellowstone Park Hotel Co., the Yellowstone Park Transportation Co., the Yellowstone Park Lodge and Camps Co., and the Yellowstone Park Boat Co. The first definite result of this consolidation has been the approval of plans for a new lay-out at Mammoth Hot Springs which will comprise in one unit a variety of services ranging from first-class hotel service down to the simplest, most informal of cabin accommodations. In establishing this new lay-out, all of the old Mammoth Hotel structure, except the modern dining room unit and the modern hotel room unit, is being razed, and as soon as the new cabin buildings are erected the old Mammoth Lodge building and surrounding cabins will be demolished.

Increase in business in Yellowstone, combined with a change in type of accommodations demanded, resulted in an overflow of visitors desiring cabin accommodations at Old Faithful and the Canyon, while at the same time the Old Faithful and Canyon Hotels were not being used to capacity, the Mammoth Hotel was little used, and the Lake Hotel had not been opened at all. To meet this unbalanced use of existing facilities, the park operator, at the suggestion of the Service, reduced the differential between the lodge and hotel rates for the regular 3½-day all-expense tour to \$2. As a consequence, at the

close of the first month's operation during the 1936 season the house count of the hotels had more than doubled and the hotel revenues had increased almost to the same degree.

With the increased use of air-cooled equipment on transcontinental railroad lines and with increased use of busses and airplanes to reach the national parks, there has been a noticeable increase in the transportation within the parks. With this increased usage of transportation equipment, the operators in Yellowstone, Glacier, Yosemite, and Rocky Mountain National Parks have embarked on a program of replacing obsolete motor equipment with new and up-to-date busses.

The operation by private concessioners of the dock at Colonial National Historical Park and the concession building at Shiloh National Military Park, both recently constructed by the Government, was begun.

A policy was established under which the milk sold in any park or monument must be handled under sanitary requirements at least equal to the laws and regulations of the State in which the park or monument is located.

Cooperation and active participation were continued in the management of the concession operations of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., Washington, D. C., and the Mammoth Cave Operating Committee at Mammoth Cave National Park, Ky., the nonprofit distributing agencies furnishing accommodations for the public under the National Capital Parks and at Mammoth Cave National Park, respectively. It is interesting to note that the 1935 gross income of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., was \$1,903,077.79, as compared with \$1,460,081.30 for 1934, with an increase in profits from \$99,852.32 to \$157,941.16. The gross income from the hotels and caves in Mammoth Cave National Park for 1935 was \$166,888.45, with a net profit of \$65,442.71. The Mammoth Cave profits are donated to the United States for the purpose of additional land purchases to complete the Mammoth Cave National Park, and in the case of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., one-half of the net profits accrue directly to the Government as revenue with the remaining half being used for welfare and recreational purposes within the District of Columbia.

Committees composed of representatives of the Western Conference of National Park Operators and the National Park Service were appointed on April 3, 1936, to study problems connected with auto camps in the parks and to consider possible methods of reducing existing building costs in park areas.

NATIONAL CAPITAL PARKS

At the end of the fiscal year the National Capital parks system comprised 692 reservations totaling 6,986.61 acres. Of these reservations 690, totaling 5,604.11 acres, were located within the District of Columbia and 2 reservations, totaling 1,382.50 acres, were located in nearby Maryland and Virginia. The total acreage in Virginia was 1,155.01 and Maryland 227.49. This represents an increase of 55.59 acres during the fiscal year.

A bill was introduced in Congress to grant authority for the National Capital parks to assume jurisdiction, for the purposes of maintenance and operation, over the Chopawamsic recreational area, now in an advanced stage of development as a National Park Service-Resettlement Administration project. This area, located approximately 40 miles from the District of Columbia boundary between Quantico and Chopawamsic Creeks in Virginia, will ultimately comprise approximately 15,000 acres of land suitable for recreational usage. Work now in progress in the area will adapt it to camping and conservation purposes. At the end of the fiscal year two camps, one for boys and one for girls, were ready for occupation by underprivileged groups from the District of Columbia.

The record flood of the Potomac River occurring on March 18-19 necessitated the construction of an emergency flood control dike in West Potomac Park and extending into the Washington Monument grounds. The dike, constructed by the personnel of National Capital parks with the assistance of Works Progress Administration and Emergency Conservation Work labor, was completed in advance of the crest of the flood.

Noteworthy progress was made toward the completion of important projects under way at the beginning of the year, and many new projects undertaken during the year were completed or reached an advanced stage of progress. Of chief interest and importance among these were the continuation of construction work on the Mall and Union Square, the principal project undertaken in National Capital Parks under Public Works Administration authorization; the rehabilitation program for small parks and triangles; the completion of work undertaken in the development of the Takoma and Banneker Recreation Centers and the starting of work upon the improvement or development of five additional recreation centers; the removal of unsightly structures from the Washington Monument grounds and the construction of a permanent flood-control levee at this location; the development of Fort Dupont and Fort Bunker Hill Parks in the outlying districts; the continuation of preliminary work on Theodore Roosevelt Memorial Island, and the

completion of roadway in section 2, Rock Creek and Potomac Parkway, the connecting link which forms a continuous parkway throughout the length of the Rock Creek Valley, joining by continuous park highways the parkways of Montgomery County, Md., with those of the District of Columbia, including the Potomac Parks and the Mount Vernon Memorial Highway.

The total attendance in the National Capital Parks during the fiscal year was estimated at 45,700,000. Approximately 23,005 permits were issued for use of the 362 recreational facilities established at 44 locations throughout the National Capital Parks system.

The total appropriation for National Capital parks administration for the year 1936 was \$3,305,509.04, of which the sum of \$898,000 was included in the District of Columbia account for the operation and maintenance of parks; and \$242,085 in the United States account for maintenance of the Battleground National Cemetery, continuation of construction of the Arlington Memorial Bridge, and restoration of park areas damaged by flood. The Executive account for maintenance, Executive Mansion and grounds, totaled \$153,700.14. In addition to the above-mentioned regular congressional appropriations the sum of \$1,112,204.90 was allotted for construction work by the Public Works Administration, \$176,858 for Emergency Conservation Work projects, and \$722,661 emergency funds for roads and trails.

MAINTENANCE OF FEDERAL BUILDINGS

The National Park Service at the close of the fiscal year provided maintenance, operation, and protection for approximately 18,300,000 square feet of floor space, 16,000,000 of which were located in 47 Government-owned buildings and 2,200,000 in 90 rented buildings in the District of Columbia, and also for 7 memorials; and similar service was provided in 11 Government-owned buildings outside the District which have a total floor area of over 1,200,000 square feet. The new United States courthouse in New York City, comprising 655,787 square feet, and the new United States courthouse at Aiken, S. C., which has a floor area of 17,474 square feet, represent the latest acquisitions of out-of-town buildings. The personnel required and funds expended incident to providing this service were as follows:

	Expenditures	Personnel
Buildings in the District of Columbia.....	\$5,910,000	¹ 4,256
Buildings outside the District of Columbia.....	408,000	272
Total.....	6,318,000	4,528

¹ Includes 196 temporary.

Responsibility for the maintenance and operation of highly specialized mechanical equipment, valued at millions of dollars, in new Government office buildings increased materially. The complete air conditioning of six of the largest buildings required the operation of refrigerating equipment totaling 12,000 tons capacity, which represents the largest single concentration of refrigerating equipment located in this country.

All mechanical equipment in the central heating plant was maintained in operating condition during the year, so that a continuous supply of steam for heating practically all the Government buildings in the District of Columbia, and some few nongovernmental buildings, could be furnished. A total of 97,200 short tons of coal was consumed in the plant, with a total steam production of over 2,000,000,000 pounds.

Three hundred and thirty elevators, together with their machinery, were maintained and operated.

Among the various improvement projects executed under the Public Works program were:

Completion of alterations and changes at the Executive Mansion; installation of air-conditioning equipment in the Agriculture Administration Building; changing electrical-current supply to the Old Interior Building from direct to alternating; remodeling the former Potomac Park Apartment Building (after its purchase by the Government) to provide office space for the Housing Division of the Federal Emergency Administration of Public Works; and remodeling, repairing, and modernizing the building at 45 Broadway, New York City. Remodeling the front of the Old Patent Office Building, incident to the widening of F Street, was practically completed.

Plans and specifications are being drawn up for physical improvements and repairs to Government buildings under the jurisdiction of this Service, including the elimination of fire hazards. An amount of \$1,150,000 for this purpose was authorized in the deficiency bill, approved June 22. The projects involved will include such improvements to the electrical systems in various buildings as the replacement of defective and obsolete wiring and equipment, replacement of antiquated elevators and auxiliary machinery, and installation of sprinkler systems in areas where files are stored.

Several of the temporary wartime buildings in the Mall area and Temporary Building No. 5, located at Twenty-first Street and Constitution Avenue, were vacated and demolished during the year. The removal of the former provided room for improvements in connection with the Mall vista, while on the site on which the latter formerly stood a new building for the Federal Reserve Board is being constructed.

A school was established for the instruction of guards in safety and service. The subjects presented are instruction in legal duties and responsibilities, technique of patrol duties, courtesy and customs of the Service, fire equipment and fire fighting, and information on uniforms, firearms, and the flag.

SPACE-CONTROL PROGRAM

During the fiscal year, 197 leases were authorized and the rental of the Government in the District attained a peak of approximately 2,766,000 square feet of space in 123 buildings, at an annual rental of approximately \$2,640,000. In transferring agencies into new and expanding locations, 376 moves were made. Detailed analyses of space reports were secured from all departments and agencies of the Government and compiled and prepared for ready reference. A survey was made of the space in all the owned and leased buildings occupied as general filing rooms, which in some cases brought about the transfer of files from usable office space to less desirable space in storage buildings. A survey of laboratories now maintained by the various departments of the Government is being made to ascertain the types of activities carried on in the different buildings in the District.

NEW INTERIOR DEPARTMENT BUILDING

The new Department of the Interior Building, being erected as a Public Works project under the supervision of the Procurement Division of the Treasury Department by the George A. Fuller Co., general contractors, which is expected to be ready for occupancy in February 1937, also will be administered by the National Park Service. It will do much to relieve the crowded space conditions under which the Federal Government now is carrying on its activities.

It is the first major Federal structure in Washington authorized, designed, and built under the present administration. Ground was broken August 12, 1935, and the cornerstone was placed by President Roosevelt on April 16, 1936. The building will have a gross floor area of 1,050,000 square feet and a net usable area of 700,000 square feet, and will accommodate approximately 5,000 persons. Important features of the new building are a large auditorium, a general library, exhibition space, a broadcasting studio, a basement garage, a large cafeteria, and an employees' lounge. Indirect lighting, air conditioning, acoustically treated office space, and escalators from the basement to the first two floors will add to the usability of the new building, which, although classic in design, is modern in its practicability. Its completion will materially aid the present serious space situation.

APPROPRIATIONS, DONATIONS, AND REVENUES

APPROPRIATIONS

Appropriations for the National Park Service during the fiscal year 1936 amounted to \$17,722,578. Of this amount the sum of \$15,719,390 was authorized in the Interior Department Appropriation Act, 1936; \$898,000 in the District of Columbia Appropriation Act, 1936; \$143,298 in the Independent Offices Appropriation Act, 1936, for maintenance of the Executive Mansion and grounds; a deficiency sum of \$891,890 for the maintenance and operation of public buildings in the District of Columbia; and a supplement of \$70,000 for Kennesaw Mountain National Battlefield Park. The sum of \$82,000 was transferred to the Service from the War Department for the purchase of additional land for Vicksburg National Cemetery.

Financing of activities under Works Progress Administration allotments was begun as follows:

Works Progress Administration

Administrative expenses of transient camps-----	\$693, 951. 00
Preliminary survey of Natchez Trace Parkway (150 miles)-----	} 1, 425, 185. 00
Grading, drainage structures of the Natchez Trace Parkway (40 miles) -----	
Acquisition of site and development of Jefferson National Expansion Memorial-----	¹ 6, 750, 000. 00
Repair or replacement of Federal property damaged or destroyed by the floods of 1936-----	77, 240. 00
Total-----	8, 946, 376. 00

¹ The sum of \$2,250,000, donated by the city of St. Louis, Mo., also available for this project.

CASH DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1936, amounted to \$315,281.80. The donations were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditure of Federal appropriations. In the 1935 fiscal year cash donations amounted to \$589,285.69.

Financing of construction activities under Public Works and Emergency Conservation Work allotments was continued during the fiscal year, as follows:

Public Works, 1933-37

Construction of roads and trails-----	\$26, 839, 415. 44
Construction of physical improvements-----	11, 716, 414. 83
Total-----	38, 555, 830. 27

*Emergency Conservation Work, procurements from April 22, 1933, to
June 30, 1936*

National parks.....	\$15, 060, 436. 00
State parks.....	46, 491, 016. 00
Territory of Hawaii.....	1, 927, 683. 00
California-Pacific National Exposition exhibit.....	9, 300. 00
Acquisition of Lands on Isle Royale for E. C. W.....	705, 000. 00
Virgin Islands.....	241, 638. 00
Acquisition of Crater property at Petersburg National Military Park for E. C. W.....	29, 750. 00
Purchase of lands for E. C. W.....	2, 325, 000. 00
Total.....	66, 789, 823. 00

REVENUES

The revenues received during the fiscal year 1936 amounted to \$1,136,533.68, as compared with revenues receipts of \$907,189.96 in the 1935 fiscal year.

APPROPRIATIONS, 1937 FISCAL YEAR

For the fiscal year 1937 there has been appropriated \$18,411,588. Of this amount, \$16,122,080 (including \$6,500,000 for road and trail construction) was authorized in the Interior Department Appropriation Act, 1937; \$908,410 in the District of Columbia Appropriation Act, 1937; \$143,098 in the Independent Offices Appropriation Act, 1937, for the Executive Mansion and grounds; and \$1,238,000 in the First Deficiency Appropriation Act, fiscal year 1936.

PUBLIC WORKS

Greatly needed road and trail construction work, as well as the various other types of physical improvements required in the administration, protection, and improvement of the areas under the jurisdiction of the National Park Service, was continued during the fiscal year 1936 due to the allocation of Public Works funds under title II of the National Industrial Recovery Act. Because of exercised care in the selection of projects, together with their geographical distribution, there resulted the greatest possible financial spread and maximum of relief to the unemployed in the vicinity of the far-flung areas administered by the Service in the United States, Hawaii, and Alaska.

The total allocation of Public Works funds for (1) roads and trails projects and (2) physical improvement projects to the end of the 1935 fiscal year, as compared with allocations for the same purposes for the fiscal year 1936, was as follows:

	Fiscal year 1935	Fiscal year 1936
Roads and trails.....	\$25, 558, 303. 95	\$26, 839, 415. 44
Physical improvements.....	10, 899, 611. 32	11, 716, 414. 83
Total.....	36, 457, 915. 27	38, 555, 830. 27

The increase of Public Works allotments for the fiscal year 1936 over the fiscal year 1935 is \$2,097,915. This increase is composed chiefly of the difference between an allocation of \$6,000,000 for construction of the Blue Ridge Parkway and the cancelation of \$4,500,000 previously impounded. Other large increased allocations were \$140,000 for the purchase and improvement of the Painted Desert Inn in Petrified Forest National Monument; \$126,500 for purchase and installation of museum equipment throughout the park system; \$172,000 for the Union Square and Mall developments; and \$65,800 for remodeling the Potomac Park Apartments for use as an office building. Several smaller items make up the balance of the increased allocations.

In addition to the Public Works allotments for construction of roads and trails, \$5,000,000 was authorized in the Emergency Relief Appropriation Act, fiscal year 1935, and \$7,500,000 in the Interior Department Appropriation Act for the fiscal year 1936.

CONCLUSION

This report for the fiscal year 1936 is submitted with a feeling of pride in the achievements of the enlarged National Park Service, and as convincing proof, I believe, that the Service has successfully weathered changing conditions of a most drastic and exacting nature.

Consolidation of all Federal park activities under the National Park Service 3 years ago, together with jurisdiction over National Capital parks and Federal buildings, threw a great burden upon an already undermanned staff. At about the same time, participation began on a large scale in the various emergency programs, and here again the service was handicapped by an altogether too small trained personnel. To complicate matters, these changes and enlargements occurred just as the Service experienced a change in leadership, occasioned by the resignation of former Director Horace M. Albright, who had been in national park work since before the establishment of the Service and who was most helpful in the organization of the Bureau and the formulation of its policies.

Laboring under the handicap of insufficient trained personnel and changing leadership, the Service cheerfully met the enlarged duties suddenly entrusted to it and carried on to the best of its ability. Necessarily the trial-and-error method often had to be substituted for

the tried-and-true method previously used in the smaller-scale administration, and undoubtedly some mistakes occurred, as must happen if real progress is to be made, but any such were incidental to the major gains accomplished.

Now the record of 3 years' efforts under the changed conditions demonstrates the ability of the National Park Service to meet emergencies, to expand so as to carry on unaccustomed activities, and to assume and maintain leadership in the field of conservation of inspirational and recreational resources.

This statement is made with full realization that the record of the past 3 years is due to the loyal support of the administrative force of the National Park Service, often under conditions of acute discouragement and of constant and unusually heavy pressure of work; and to the officials of the Department of the Interior, who with patience and forbearance have upheld the National Park Service during this period of development and stabilization.

To all who have contributed in any way to the support of national-park ideals and to the practical protection of the national parks and monuments, the Service is sincerely grateful. Especially is acknowledgment made of the support of conservationists at crucial moments in national park and monument history, and to cooperating officials of other Federal bureaus who helped to smooth the path of national park administration.

With this cheerful reflection of the work of the past, the National Park Service looks forward with unbounded confidence to the future.

NATIONAL PARK TABLE 1.—Holdings acquired for national park and monument purposes

Parks and monuments	Holdings acquired from July 1, 1935, through June 30, 1936						Holdings acquired prior to July 1, 1935, in acres	Total holdings acquired through June 30, 1936, in acres
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase		Total area acquired in acres		
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park.....				Donation.....	1,452.417	1,452.417	13,956.49	15,408.907
Aztec Ruins National Monument.....				Donation.....	60.00	60.00	25.88	25.88
Black Canyon of the Gunnison National Monument.....				do.....	2,365.84	2,365.84	105.00	105.00
Blue Ridge Parkway.....				Exchange.....	2,560.00	2,560.00	441.00	441.00
Carlsbad Caverns National Park.....				do.....	3,000.00	3,000.00	3,832.86	6,392.86
Chickamauga and Chattanooga National Military Park.....				do.....	15.24	1,900.47	4,250.029	6,150.499
Colonial National Historical Park.....	\$180,859.00		1,885.23				649.20	649.20
Colorado National Monument.....							1.00	1.00
Crater Lake National Park.....							320.00	320.00
Craters of the Moon National Monument.....							17.34	17.34
Fort Matanzas National Monument.....							2,439.15	2,439.15
Fredericksburg and Spotsylvania National Military Park.....							20.00	31.512
General Grant National Park.....	4,900.00	\$4,900.00	11,512			11,512	483.70	483.70
George Washington Birthplace National Monument.....							3,950.21	3,950.21
Glacier National Park.....				Exchange.....	905.02	905.02	30,843.85	31,748.87
Grand Canyon National Monument.....				do.....	3,230.67	3,230.67	506.83	3,737.50
Great Smoky Mountains National Park.....				Donation.....	595.70	794.95	1394.08835	1394.88330
Hawaii National Park.....	38,825.00		199.25				156,800.00	156,800.00
Hot Springs National Park.....							79.20	79.20
Kings Mountain National Military Park.....				Donation.....	40.09	40.09	40.09	40.09
Lassen Volcanic National Park.....							40.00	40.00
Mammoth Cave National Park.....				Donation.....	22,990.59	24,537.76	350.20	24,537.76
Mesa Verde National Park.....	52,720.23		1,577.17				953.38	350.20
Morristown National Historical Park.....				Donation.....	4.06	4.06	427.79	427.79
Muir Woods National Monument.....				Donation.....	514.88	514.88	1,556.10	1,608.46
Ocmulgee National Monument.....				do.....	142.36	142.36	23,529.32	23,529.32
Petersburg National Military Park.....				Donation.....	160.00	160.00	1,926.27	2,086.27
Petrified Forest National Monument.....				do.....	3,316	117,743	5,096.555	5,214.298
Pinnacles National Monument.....							162.08	162.08
Rocky Mountain National Park.....							3,294.25	3,294.25
Scotts Bluff National Monument.....	4,885.00	3,045.00	114,427				3,294.25	3,294.25
Sequoia National Park.....							176,510.02	176,510.02
Shenandoah National Park.....	81,446.75		8,136.64	Donation.....	168,382.38	176,510.02	1.125	1.125
Shiloh National Military Park.....	2,200.00							

NATIONAL PARKS TABLE 2.—*Automobile and motorcycle licenses issued during season 1932-36*

Name of park ¹	1932		1933		1934		1935		1936	
	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles	Auto- mobiles	Motor- cycles
Crater Lake.....	29,637	-----	19,924	-----	18,521	-----	24,297	-----	30,718	-----
General Grant ²	5,900	-----	6,199	-----	7,992	-----	4,199	-----	3,100	-----
Glacier.....	10,712	11	8,955	10	12,146	18	17,718	40	23,896	50
Grand Canyon.....	32,651	-----	30,104	-----	28,721	-----	35,890	-----	55,721	-----
Lassen Volcanic.....	4,803	3	4,924	9	6,859	7	6,437	8	8,947	10
Mesa Verde.....	4,382	-----	4,262	-----	3,947	-----	4,177	-----	5,008	-----
Mount Rainier.....	44,719	-----	31,903	-----	32,095	-----	37,801	-----	39,187	-----
Sequoia ²	18,304	-----	17,045	-----	17,401	-----	25,304	-----	38,289	-----
Yellowstone.....	52,597	155	38,580	46	44,886	170	54,421	186	86,313	272
Yosemite.....	67,482	129	61,742	118	64,055	124	67,731	122	84,936	192
Zion.....	12,967	-----	12,194	-----	14,352	-----	21,271	-----	28,495	-----
Total.....	284,154	298	235,832	183	250,975	319	299,246	356	404,610	524

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks, because of small road mileage or unimproved condition of roads.

² Permits entrance to General Grant and Sequoia.

NATIONAL PARKS TABLE 3.—*Receipts collected from automobile and motorcycles during seasons 1932-36*

Name of park ¹	1932	1933	1934	1935	1936
Crater Lake.....	\$29,687.00	\$19,924.00	\$18,521.00	\$24,297.00	\$30,718.00
General Grant ²	2,950.00	3,099.50	3,996.00	4,199.00	3,100.00
Glacier.....	11,092.00	8,965.09	12,164.00	17,758.00	23,946.00
Grand Canyon.....	32,764.00	30,104.00	28,721.00	35,890.00	55,721.00
Lassen Volcanic.....	5,778.50	4,928.50	6,862.50	6,441.00	8,952.00
Mesa Verde.....	4,396.00	4,262.00	3,947.00	4,177.00	5,008.00
Mount Rainier.....	44,719.00	31,903.00	32,095.00	37,801.00	39,187.00
Sequoia ²	18,304.00	17,045.00	17,401.00	25,304.00	38,289.00
Yellowstone.....	156,537.00	115,786.00	134,828.00	163,419.00	259,596.00
Yosemite.....	135,831.00	123,602.00	128,234.00	135,584.00	170,064.00
Zion.....	12,976.00	12,194.00	14,352.00	21,271.00	28,495.00
Total.....	455,034.50	371,813.00	401,121.50	476,171.00	663,076.00

¹ No licenses required for Wind Cave, Hot Springs, Platt, Hawaii, Rocky Mountain, Carlsbad Caverns, Mount McKinley, and Acadia National Parks.

² Permits entrance to General Grant and Sequoia.

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during fiscal years 1936 and 1937*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Acadia (formerly Lafayette):			
1936.....	\$46,000.00	\$44,344.48	320.50
1937.....	46,000.00		
Bryce Canyon:			
1936.....	12,000.00	12,231.23	
1937.....	12,000.00		
Carlsbad Caverns National Park:			
1936.....	64,000.00	62,772.79	173,404.90
1937.....	64,000.00		
Crater Lake:			
1935-36.....	5,000.00	5,000.00	
1936.....	57,600.00	56,595.49	31,131.70
1937.....	62,600.00		
General Grant:			
1936.....	15,000.00	14,520.37	3,143.20
1937.....	15,000.00		
Glacier:			
1936.....	175,000.00	172,849.94	30,902.06
1937.....	175,000.00		
Grand Canyon:			
1936.....	113,500.00	111,708.60	67,029.86
1937.....	113,500.00		
Grand Teton:			
1936.....	19,900.00	19,844.89	166.86
1937.....	19,900.00		
Great Smoky Mountains:			
1936.....	59,900.00	57,800.66	9,846.83
1937.....	59,900.00		
Hawaii:			
1936.....	45,600.00	45,147.34	457.90
1937.....	45,600.00		
Hot Springs:			
1936.....	71,200.00	69,261.34	34,991.85
1937.....	71,200.00		
Lassen Volcanic:			
1936.....	28,400.00	31,906.84	8,954.00
1937.....	28,400.00		
Mesa Verde:			
1936.....	47,250.00	46,379.58	5,238.22
1937.....	47,250.00		
1937 (deficiency).....	10,000.00		
Mount McKinley:			
1936.....	25,000.00	24,635.39	127.76
1937.....	25,000.00		
Mount Rainier:			
1936.....	121,800.00	114,200.91	43,751.73
1937.....	121,800.00		
National Capital Parks:			
1936.....	898,000.00	881,483.13	33,122.19
1937.....	1,074,410.00		
Platt:			
1936.....	20,600.00	19,966.77	
1937.....	20,600.00		
Rocky Mountain:			
1936.....	82,000.00	78,263.84	4,326.60
1937.....	82,000.00		
Sequoia:			
1936.....	99,500.00	97,083.51	57,835.16
1937.....	99,500.00		
Shenandoah:			
1936.....	39,800.00	23,182.52	311.00
1937.....	39,800.00		
Wind Cave:			
1936.....	15,900.00	15,408.29	8,678.81
1937.....	15,900.00		
Yellowstone:			
1936.....	394,100.00	381,883.28	329,926.72
1937.....	391,250.00		
Yosemite:			
1936.....	286,100.00	266,520.62	249,585.42
1937.....	284,000.00		
Zion:			
1936.....	39,800.00	39,149.31	28,638.66
1937.....	39,800.00		

NATIONAL PARKS TABLE 4.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during fiscal years 1936 and 1937—Continued*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
National Historical Parks and Monuments:			
1936.....	\$92,300.00	\$96,006.51	\$563.90
1937.....	109,400.00		
National Monuments:			
1936.....	111,660.00	105,044.98	1,714.07
1937.....	167,000.00		
National Military Parks, Battlefields, Monuments, and Cameteries:			
1936.....	239,600.00	226,927.79	2,060.39
1937.....	257,900.00		
Boulder Canyon project:			
1937.....	10,000.00		
National Park Service:			
1936.....	175,380.00	156,596.61	2,186.54
1937.....	189,880.00		
Public Buildings and Grounds:			
1936.....	5,615,000.00	6,417,061.21	4,270.05
1936 (deficiency).....	891,890.00		
1937.....	6,535,900.00		
1937 (deficiency).....	1,150,000.00		
General expenses, National Park Service:			
1936.....	25,000.00	22,083.46	
1937.....	27,000.00		
Forest protection and fire prevention:			
1935-36.....	75,000.00	67,418.72	
1937.....	90,000.00		
Emergency reconstruction and fighting forest fires:			
1937.....	40,000.00		
Construction of roads and trails:			
1936.....	7,500,000.00	3,540,720.73	
1937.....	6,500,000.00		

NATIONAL PARKS TABLE 5.—*Statement of appropriations made for, and revenues received from, the various national parks and national monuments, and expenditures made therefrom during recent fiscal years*

Name of the national park	Appropriations		Revenue received
	Appropriated	Expended	
Public Works projects, roads and trails:			
1933-37.....	\$25,839,415.44	\$23,026,437.35	
Public Works projects, physical improvements:			
1933-37.....	11,716,414.83	10,866,713.23	
Federal Emergency Relief, 1935.....	396,819.72	396,819.72	
Emergency Conservation Work:			
1933-37 (allotments program).....	76,068,228.00		
Works Progress Administration:			
1936-37.....	8,946,376.00	991,370.13	
Commission of Fine Arts:			
1936.....	9,700.00	9,360.73	
1937.....	9,700.00		
Big Dry Wash Battlefield:			
1936.....	500.00		
Perry's Victory Memorial:			
1936.....	4,000.00	2,522.24	\$3,320.80
1937.....	4,000.00		
Mount Rushmore National Memorial Commission:			
1936.....	55,000.00	54,038.31	500.00
1937.....	100,000.00		
Appomattox Court House National Historical Monument:			
1937.....	¹ 100,000.00		
Historic Sites and Buildings Survey:			
1937.....	24,000.00		
Investigation and purchase of water rights:			
1937.....	25,000.00		

¹ Available until expended.

NATIONAL PARKS TABLE 6.—*Statement of accounts reappropriated and made available for expenditure in subsequent fiscal years*

Appropriated for fiscal year	Reap- propri- ated for fiscal year	Park	Amount	Purpose
1928.....	1929	Yosemite.....	\$35,000.00	Hospital building.
1928.....	1929	Southern Appalachian.....	1,112.87	To remain available; general.
1928.....	1929	Emergency reconstruction and fighting forest fires.	13,134.54	Do.
1929.....	1930	Yosemite.....	8,661.78	Construction of water-supply and camp-ground facilities.
1929.....	1930	Carlsbad Caverns.....	4,950.00	Superintendent's residence.
1929.....	1930	Southern Appalachian.....	1,662.55	To remain available; general.
1929.....	1931	Grand Canyon.....	20,000.00	Hospital building.
1930.....	1931	Acadia.....	2,850.00	Equipment storage building.
1930.....	1931	Crater Lake.....	1,091.06	Ranger station.
1930.....	1931	Mesa Verde.....	1,652.18	2 ranger stations.
1930.....	1931	Yosemite.....	32,662.70	Physical improvements.
1930.....	1931	National monuments.....	2,500.00	Employees' quarters (2) at Petrified Forest.
1930.....	1931	Southern Appalachian.....	1,246.80	To remain available; general.
1930.....	1931	Glacier.....	9,550.00	One-third of cost of constructing a telephone line.
1931.....	1932	National monuments.....	1,759.23	Water-supply system at Craters of the Moon.
1931.....	1932	Emergency reconstruction and fighting forest fires.	7,434.15	To remain available; general.
1931.....	1933	National monuments.....	3,204.50	Water supply at Chaco Canyon.
1932.....	1933	Carlsbad Caverns.....	13,000.00	Electric system, extension and improvement.
1932.....	1933	Emergency reconstruction and fighting forest fires.	16,587.00	To remain available; general.
1933.....	1934	do.....	9,143.93	Do.
1934.....	1935	do.....	75,000.00	Do.
1935.....	1936	do.....	64,642.13	Do.
1936.....	1937	Ackia Battleground National Monument.	15,000.00	Do.

NATIONAL PARKS TABLE 7.—*Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917¹ to 1937, inclusive*

Year	Department	Appropriation	Revenues
1917	Interior Department.....	\$537,366.67	
	War Department.....	247,200.00	
		\$784,566.67	\$180,652.30
1918	Interior Department.....	530,680.00	
	War Department.....	217,500.00	
		748,180.00	* 217,330.55
1919	Interior Department.....	963,105.00	
	War Department.....	50,000.00	
		50,000.00	
1920		1,013,105.00	196,678.03
1921		907,070.76	316,877.96
1922		1,058,969.16	396,928.27
1923		1,433,220.00	432,964.89
1924		1,446,520.00	513,706.36
1925		1,892,601.00	663,886.32
1926		3,027,657.00	670,920.98
1927		3,258,409.00	826,454.17
1928		3,698,920.00	703,849.60
1929		4,889,685.00	808,255.81
1930		4,754,015.00	849,272.95
1931		7,813,817.18	1,015,740.56
1932		12,113,435.00	940,364.79
1933		12,831,250.00	820,654.19
1933-35		10,640,620.00	628,182.06
1934		53,402,249.00	
1935		10,983,089.00	731,331.80
1936		12,461,513.00	907,189.96
1937		16,686,090.00	
		18,190,490.00	

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.

² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 8.—*Statement of appropriations and authorizations for road and trail work in the national parks and national monuments*

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 3, 1924; 43 Stat. 680.....	1925	\$1,000,000		\$1,000,000
Act Mar. 3, 1925; 43 Stat. 1479.....	1926	1,500,000	² \$1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491.....	1927	2,000,000	² 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 963.....	1928	2,000,000	² 2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19.....		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 257.....	1929	2,500,000	² 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601.....	1930	5,000,000	² 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319.....		5,000,000		
Act Dec. 20, 1930; emergency construction	1931	1,500,000	² 2,500,000	
Emergency construction funds transferred by the President.		578,800		
Act Feb. 14, 1931; 46 Stat. 1115.....	1932	5,000,000	² 2,850,000	7,078,800
Second Deficiency Act 1931; Mar. 4, 1931.....		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127.....	1933	4,500,000	² 2,500,000	7,150,000
Emergency construction and relief.....		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853.....	1934	2,435,700		-64,300
Emergency construction.....	1935	5,000,000		5,000,000
Act May 9, 1935; Public, No. 53, 74th Cong.....	1936	7,500,000		7,500,000
Act June 22, 1936; Public, No. 741, 74th Cong.....	1937	6,500,000		6,500,000
Total appropriated.....		58,514,500		
Total program to date.....				58,514,500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

NATIONAL PARKS TABLE 9.—Forest-fire statistics, calendar year 1955

	Classification			Point of origin			Burned area inside parks (nearest whole acre)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)									
	A	B	C	Total	Inside parks		Outside parks	Total				Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees not paid from F. F. F.	Grand total	C. C. C. man-days contributed	
					On Government land	On private land		Entered park	Confined to outside areas	Timber	Brush												Grass
1/4 acre or less	Between 1/4 and 10 acres	10 acres or over	All classes A-B-C	No.	No.	No.	No.	No.	No.	Acres	Acres	Acres	M.b.f.	M.b.f.	M.b.f.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	No.	
Acadia.....	1			1	1							1	3		3					2	2	3	
Bryce Canyon.....																							
Carlsbad Caverns.....																							
Crater Lake.....	25	3		28	28							4				13	55	787	17	872	79	951	404
General Grant.....																							
Glacier.....	25	1	2	28	25	1		2	1,278	168		1,446	1,850	2	1,850	4,168	8,939	8,189	10,415	31,711	1,053	32,764	19,079
Grand Canyon.....	7	7		14	9			5	5	1		6			2	26	48			74	48	122	75
Grand Teton.....	12	1	1	14	8			6													11	11	370
Great Smoky Mountains.....	6	9	7	22	11	2		9	28	1	9	38				21				21	45	66	419
Hawaii.....																							
Hot Springs.....	2	10		12	10		2		33			33									32	32	
Lassen Volcanic.....	4	1	5	10	4	1		1	1				5								149	149	123
Mammoth Cave.....	21	68	14	103	54	47		2	263	86	199	548									191	850	
Mesa Verde.....	1			1	1			1													2	2	
Mount McKinley.....																							
Mount Rainier.....	1	1	1	3	2	1		1		4		4				9	28		37	29	66	516	
Platt.....	1			1	1																		
Rocky Mountain.....	2			2	2								1								6	6	
Sequoia.....	25	8	2	35	28			7	18			18	40		40	8	40		48	263	311	1,156	
Shenandoah.....			4	4	4			4	105	2	18	125	26		26		1		1	78	79	276	
Wind Cave.....																							
Yellowstone.....	49	7	4	60	56			4	103	1	1	105	290		290	165	535	665	188	1,553	906	2,459	14,523
Yosemite.....	34	5	1	40	38	2		5	9	53		62	12		12	5	3			8	103	111	2,867
Zion.....	1			1	1					9		9									27	27	56
Military and historical parks: Chickamauga-Chat-tanooga.....	6	1		7	6	1			8		52	60									9	9	274

¹ Includes 3,163 man-days on Forest Service fire.

² Includes 620 man-days on outside fires.

NATIONAL PARKS TABLE 9.—*Forest-fire statistics, calendar year 1935*—Continued

	Classification				Point of origin				Burned area inside parks (nearest whole area)				Timber destroyed inside parks			Cost of fire suppression (to nearest whole dollar)							
	A	B	C	Total	Inside parks		Outside parks		Timber	Brush	Grass	Total	Government	Private	Total	Personal services	Supplies, transportation, etc.	Equipment	Indirect costs prorated	Total	Salaries of park employees not paid from F. F. F.	Grand total	C. C. C. man-days con- tributed
					On Government land	On private land	Entered park	Confined to out- side areas															
	1/4 acre or less	Between 1/4 and 10 acres	10 acres or over	All classes A-B-C	No.	No.	No.	No.	Acres	Acres	Acres	Acres	M.b.f.	M.b.f.	M.b.f.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	No.	
Military and historical parks—Continued.	4				4	3	1		2	2	2	2										9	
Fredericksburg.....		1			1	1			2	1	1	2							25	54	79	31	
Gettysburg.....		2			2	1	1		3			3								11	11	11	
Morristown.....																							
Petersburg.....	4	4	1		9	9				53		53										6	
Shiloh.....	20	4			24	15	8	1		3		3							11	8	15	23	
Vicksburg.....																							
Monuments:																							
Bandelier.....	1				1	1																9	
Chiricahua.....																							
Colonial.....		4			4	4			1	8	9						4			4	6	10	4
Death Valley.....																							
Devils Tower.....																							
Lava Beds.....		1	1	2	1	1		2														97	
Muir Woods.....		1		1	1	1		1															
Pinnacles.....			2	2	1	1		1	170		170											144	
Oregon Caves.....																							
Scotts Bluff.....	1			1	1	1																1	
Total.....	246	150	41	437	321	60	10	46	1,861	498	343	2,702	2,229		2,229	4,415	9,653	9,641	10,656	34,365	3,129	37,494	29,326

NOTE.—Yellowstone, \$352.80 emergency allotment from F. F. F. not included in fire-suppression costs. Glacier, \$356.56 emergency allotment from F. F. F. not included in fire-suppression costs.

Classification of fires according to cost of suppression (includes only those fires which burned inside park boundaries)

[illegible]

NATIONAL PARKS TABLE 9.—*Forest-fire statistics, calendar year 1935*—Continued

	Causes of fires										Classification of fires according to cost of suppression (includes only those fires which burned inside park boundaries)									
	Lightning fires	Camp-fires	Smokers	Debris burning	Incendiary	Lumbering	Railroads	Miscellaneous	Total man-caused	Grand total	\$25 and under	\$26 to \$50	\$51 to \$100	\$101 to \$200	\$201 to \$500	\$501 to \$1,000	\$1,001 to \$2,000	\$2,001 to \$5,000	Over \$5,000	Total
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Monuments—Continued.																				
Devils Tower																				
Lava Beds				2					2	2										
Muir Woods				1				1	1	1	1						1			1
Pinnacles								2	2	2			1							1
Oregon Caves																				
Scotts Bluff			1						1	1	1									1
Total	117	32	119	43	90	2	4	30	320	437	323	26	17	12	8	1	1	1	2	391

NOTE.—C. C. C. labor valued at \$1.50 per day, or \$0.25 per hour, used in above table.

NATIONAL PARKS TABLE 10.—*Buildings in the District of Columbia maintained, operated, and protected by the National Park Service*

Building	Location	Government-owned gross floor area	Rented net floor area
		<i>Square feet</i>	<i>Square feet</i>
Administration	The Mall at 13th St.	307,692	
Archives	Constitution Ave. between 7th and 9th Sts. NW.	496,200	
Army Medical Museum	7th St. and Independence Ave. SW	83,938	
Arlington	Vermont Ave. and H St. NW	575,000	
Atlantic ²	928-30 F St. NW		38,337
Bureau of Fisheries	6th St. and Independence Ave. SW	39,131	
Barber & Ross ²	11th and G Sts. NW		23,082
Barr ²	910 17th St. NW		26,499
Bond ²	14th St. and New York Ave. NW		18,874
Bragg ²	12th and G Sts. NW		1,490
Capitol Courts, 43-49			¹ 2,500
Carpenters ²	10th and K Sts. NW		14,214
Civil Service	7th, 9th, F, and G Sts. NW	246,244	
Columbian ²	416 5th St. NW		11,726
Commerce	Constitution Ave. between 14th and 15th Sts. NW.	1,605,066	
Commercial National Bank	14th and G Sts. NW		2,570
Connecticut Ave. NW., 1108 ²			1,429
Connecting wing	Between new I. O. C. and Labor Buildings	234,100	
Courts	310 6th St. SW		5,373
Daily News	1322 New York Ave. NW		22,000
DeMoll	12th and G Sts. NW		15,243
E Building	6th St. and Maine Ave. SW	231,771	
E St. NW., 801			19,975
E St. NW., 1300		274,373	
E St. NW., 1345 ²			7,544
Executive Office	West Executive Ave.	40,000	
F Building	7th St. and Constitution Ave. NW	266,560	
F St. NW., 918 ²			701
F St. NW., 920 ²			1,230
F St. NW., 1723-25		20,369	
F St. NW., 1724			¹ 46,946
Florida Ave. NE., 60			31,800
G St. NW., 1328			4,000
G St. NW., 1712 (Annex)		8,166	
G St. NW., 1712			¹ 84,981
Garage	Kansas Ave. and Upshur St. NW		43,723
Do.	3d and Canal Sts. SW	48,000	
Garage (White House)	1126 21st St. NW		60,784
Garage	21st St. and Virginia Ave. NW	36,000	
Do.	24th and M Sts. NW		53,000
General Accounting	Judiciary Square	196,554	
H St. NW., 1712 ²			4,000
H St. NW., 1825			182,954
Home Owners' Loan Corporation	101 Indiana Ave. NW	121,700	
Hurley-Wright	18th St. and Pennsylvania Ave. NW		87,516
I St. NW., 1004 ²			489
I St. NW., 1624			13,000
Independence Ave. SW., 816		4,239	
Independence Ave. SW., 908		17,408	
Interior	E, F, 18th, and 19th Sts. NW	726,535	
Internal Revenue	Constitution Ave. between 10th and 12th Sts. NW.	1,281,000	
Interstate Commerce	12th St. and Constitution Ave. NW	456,700	
Justice	Constitution Ave. between 9th and 10th Sts. NW.	1,237,000	
K St. NW., 1415 ²			5,374
K St. NW., 1435			15,000
Kellogg ²	1416 F St. NW		4,715
Labor	14th St. and Constitution Ave. NW	447,000	
LaSalle ²	1028 Connecticut Ave. NW		49,416
Lemon	1729 New York Ave. NW		26,620
Lenox	1623 L St. NW		22,000
Lincoln	514 10th St. NW		13,938
Linworth Place SW., 300		50,250	
M Street NW., 2214			9,317
McCrory ²	826 7th St. NW		10,683
McGill ²	906 G St. NW		19,417
McKinley Park Buildings	20 buildings, American University Park		65,903
Massachusetts Ave. NW., 2000			12,000
Massachusetts Ave. NW., 2020			19,242
Mather ²	916 G St. NW		17,080

Footnotes at end of table.

NATIONAL PARKS TABLE 10.—Buildings in the District of Columbia maintained, operated, and protected by the National Park Service—Continued

Building	Location	Government-owned gross floor area	Rented net floor area
		<i>Square feet</i>	<i>Square feet</i>
Mechanical Shops (Agricultural).	13th St. and Constitution Ave. NW.....	32, 058	
Mills ²	17th St. and Pennsylvania Ave. NW.....		837
Moses ²	11th & F Sts. NW.....		97, 378
Munitions.....	Constitution Ave. between 19th and 21st Sts. NW.	851, 490	
Navy.....	Constitution Ave. between 17th and 19th Sts. NW.	949, 182	
Ouray ²	801 G St. NW.....		21, 068
Pennsylvania Ave. NW., 1653.			3, 288
Pennsylvania Ave. NW., 1778.			198, 507
Post Office (new).....	Pennsylvania Ave. between 12th and 13th Sts. NW.	840, 000	
Post Office (old).....	12th St. and Pennsylvania Ave. NW.....	377, 951	
Potomac Park Apartment.	21st and C Sts. NW.....	108, 000	
Premier Apartment.....	718 18th St. NW.....		26, 400
Printeraft.....	930 H St. NW.....		27, 919
Procurement Division.....	8th, 9th, C, and D Sts. SW.....	886, 750	
Public Health.....	Constitution Ave. between 19th and 20th Sts. NW.	79, 931	
Research.....	19th St. and Constitution Ave. NW.....	5, 200	
Rizik.....	1737 L St. NW.....		15, 983
Rochambeau.....	815 Connecticut Ave. NW.....		1 100, 000
Security.....	1518 K St. NW.....		10, 632
South.....	12th, 14th, and C Sts. and Independence Ave. SW.	2, 056, 430	
South Capitol St., 401.			55, 080
Standard Oil ²	261 Constitution Ave. NW.....		24, 615
State Department.....	17th and Pennsylvania Ave. NW.....	440, 250	
Storage Building and Vault.....	Missouri Ave. between 4½ and 6th Sts. NW.	5, 949	
Tariff Commission.....	7th, 8th, E, and F Sts. NW.....	140, 118	
Tempo. No. 2.....	19th and D Sts. NW.....	78, 240	
Tempo. No. 7.....	1800 C St. NW.....	56, 359	
Vermont Ave. NW., 1001 ³			100, 414
Vermont Ave. NW., 1025.....			54, 696
Vermont Court NW., 1125.....			13, 631
Walker-Johnson.....	1734 New York Ave. NW.....		1 87, 456
Washington.....	15th St. and New York Ave. NW.....		26, 167
Washington Auditorium.....	19th St. and New York Ave. NW.....		84, 000
Washington Loan & Trust ²	9th and F Sts. NW.....		15, 698
Wilkins.....	1514 H St. NW.....	54, 000	
Willard.....	513-15 14th St. NW.....		26, 543
Winder.....	17th and F Sts. NW.....	63, 880	
5th St. NW., 420.....			4, 948
7th St. NW., 425.....			7, 000
8th St. SW., 215.....		5, 970	
10th St. NW., 1918.....			39, 000
12th St. SW., 224.....		13, 204	
14th St. NW., 509 ³			6, 540
15th St. NW., 821.....			10, 446
21st St. NW., 1503.....			5, 000
26th St. NW., 501-13.....			22, 200
26th St. NW., 517.....			5, 000
Total.....		16, 095, 958	2, 207, 131

¹ Gross area.² Either maintenance, operation, or protection or all three classes of service provided only for a portion of the building. All other buildings except 1001 Vermont Ave. NW. maintained, operated, or protected in their entirety.³ Protection service only is provided.

NATIONAL PARKS TABLE 11.—*Buildings outside the District of Columbia maintained, operated, and protected by the National Park Service*

Building	Location	Government-owned gross floor area
		<i>Sq. ft.</i>
Broadway, 45.....	New York City, N. Y.....	142,500
Courthouse.....	Aiken, S. C.....	17,474
Do.....	Galveston, Tex.....	15,000
Do.....	New York City, N. Y.....	655,787
Do.....	Santa Fe, N. Mex.....	47,600
Federal Office.....	Des Moines, Iowa.....	64,200
Immigration Station.....	Baltimore, Md.....	98,000
Old Customhouse.....	Denver, Colo.....	72,500
Old Post Office.....	Parkersburg, W. Va.....	34,900
Do.....	Sacramento, Calif.....	47,600
Sub-Treasury.....	New York City, N. Y.....	72,000
Total.....		1,267,561

NATIONAL PARKS TABLE 12.—*Memorials maintained, operated, and protected by the National Park Service*

Memorial	Location	Gross floor area
		<i>Sq. ft.</i>
Columbus Fountain.....	Union Station Plaza.....	
District of Columbia War Memorial.....	West Potomac Park.....	
Lee Mansion.....	Arlington, Va.....	7,252
Lincoln House.....	516 10th St. NW.....	4,234
Lincoln Memorial.....	West Potomac Park.....	
Lincoln Museum.....	511 10th St. NW.....	30,510
Washington Monument.....	The Mall between 14th and 17th Sts.....	
Total.....		41,996

NATIONAL PARKS TABLE 13.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935-June 30, 1936

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			
		New construction			Maintenance—national parks and monuments
		National parks and monuments	State parks	Combined total national parks and State parks	
Foot bridges.....	Number.....	33	454	487	-----
Horse bridges.....	Number.....	11	27	38	12
Vehicle bridges.....	Number.....	19	129	148	12
Buildings:					
Barns.....	Number.....	10	10	20	1
Bath houses.....	Number.....	1	27	28	1
Cabins, overnight.....	Number.....	-----	323	323	-----
Combination buildings.....	Number.....	-----	51	51	-----
Buildings:					
Contact station.....	Number.....	13	20	33	9
Dwellings.....	Number.....	50	57	107	175
Equipment and supply storage houses.....	Number.....	55	261	316	29
Garages.....	Number.....	24	394	418	13
Latrines and toilets.....	Number.....	85	464	549	44
Lodges.....	Number.....	3	17	20	12
Lookout:					
Houses.....	Number.....	3	16	19	6
Towers.....	Number.....	15	12	27	-----
Museums.....	Number.....	2	3	5	9
Shelters:					
Trail-side.....	Number.....	7	131	138	-----
Other.....	Number.....	5	140	145	2
Other buildings.....	Number.....	42	279	321	19
Cribbing, including filling.....	Cubic yard.....	9,362	14,668	24,030	550
Dams:					
Impounding and large diversion.....	Number.....	8	50	58	1
Concrete.....	Cubic yard.....	375	20,864	21,239	-----
Fill:					
Earth.....	Cubic yard.....	5,473	715,549	721,022	-----
Rock.....	Cubic yard.....	220	13,934	14,154	20
Excavation:					
Earth.....	Cubic yard.....	1,110	287,298	288,408	1
Rock.....	Cubic yard.....	100	42,785	42,885	-----
Masonry.....	Cubic yard.....	420	10,503	10,923	-----
Riprap.....	Square yard.....	452	41,746	42,198	-----
Steel.....	Pound.....	8,918	658,611	667,529	-----
Fences.....	Rod.....	27,349	131,493.2	158,842.2	2,242
Guard rails.....	Rod.....	5,565	36,991.9	42,556.9	10
Levees, dikes, and jetties.....	Cubic yard.....	-----	20,688	20,688	-----
Power lines.....	Mile.....	14.7	60.9	75.6	775.9
Disposal:					
Beds.....	Square yard.....	280	79,419	79,699	-----
Tanks and cesspools.....	Number.....	48	240	288	1
Incinerators.....	Number.....	1	83	84	-----
Sewer lines.....	Linear foot.....	19,850	143,209	163,059	6,350
Other sewage and waste disposal.....	Man-day.....	1,217	7,216	8,433	126
Telephone lines.....	Mile.....	244.9	263.7	508.6	1,760
Drinking fountains.....	Number.....	-----	251	251	-----
Open ditches.....	Linear foot.....	1,200	22,438	23,638	-----
Water pipe or tile lines.....	Linear foot.....	95,910	608,727	704,637	13,880
Springs, water holes, small reservoirs.....	Number.....	66	163	229	4
Water-storage facilities (omit last 000).....	Gallon.....	-----	4,269.1	4,269.1	-----
Wells, including pumps and pump houses.....	Number.....	9	152	161	1
Water supply systems, other.....	Man-day.....	2,310	18,453	20,763	129
Camp stoves or fireplaces.....	Number.....	1,524	3,402	4,926	17
Cattle guards.....	Number.....	8	52	60	-----
Corrals.....	Number.....	13	31	44	3
Portals.....	Number.....	6	80	86	-----
Seats.....	Number.....	130	1,838	1,968	1
Signs, markers, and monuments.....	Number.....	4,232	5,339	9,571	2,354
Stone walls.....	Rod.....	2,100	4,045.6	6,145.6	-----
Table and bench combinations.....	Number.....	1,097	7,199	8,296	-----
Tool boxes.....	Number.....	15	401	416	1
Miscellaneous structural improvements.....	Number.....	206	13,682	13,888	-----
Radio stations.....	Number.....	-----	-----	-----	63
Truck trails.....	Miles.....	84.4	351.1	435.5	929.2
Minor roads.....	Miles.....	240.5	-----	240.5	1,306.1

NATIONAL PARKS TABLE 13.—Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935-June 30, 1936—Continued

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			
		New construction			Maintenance—national parks and monuments
		National parks and monuments	State parks	Combined total national parks and State parks	
Highways.....	Miles.....				1,365.5
Park roads.....	Miles.....	.2	565	565.2	
Foot trails.....	Miles.....	152	693.4	845.4	190.6
Horse trails.....	Miles.....	329.5	247.6	577.1	2,090.5
Stream and lake bank protection.....	Square yards.....	157,136	689,686	846,822	9,206
Treatment of gullies—Area treated.....	Acres.....	4,854.2	10,373.5	15,227.7	303.2
Bank sloping.....	Square yards.....	447,787	650,462	1,098,249	74,788
Check dams:					
Permanent.....	Number.....	1,421	7,114	8,535	
Temporary.....	Number.....	2,857	3,254	6,111	1,324
Seeding and sodding.....	Square yards.....	3,233,848	1,363,978	4,597,826	217,855
Tree planting, gully.....	Square yards.....	935,277	303,524	1,238,801	
Ditches, diversion.....	Linear feet.....	17,846	41,761	59,607	3,490
Terracing.....	Miles.....		3.7	3.7	
Sheet erosion planting.....	Acres.....	50	377.5	427.5	
Limestone quarrying.....	Tons.....		155,261	155,261	
Miscellaneous erosion control work.....	Man-days.....		91,204	91,204	
Clearing and cleaning:					
Channels.....	Square yards.....		556,296	556,296	
Reservoir sites.....	Acres.....		1,079.1	1,079.1	
Excavation:					
Earth.....	Cubic yards.....	46,332	1,358,992	1,405,324	
Rock.....	Cubic yards.....	124	29,255	29,379	
Pipe lines and conduits.....	Linear feet.....	22,042		22,042	
Riprap or paving:					
Rock or concrete.....	Square yards.....	9,261	243,090	252,351	
Brush or willows.....	Square yards.....	4,649	2,780	7,429	
Water-control structures:					
Concrete or masonry.....	Cubic yards.....	400	6,755	7,155	1
Wooden.....	Feet b. m.....	11,189	40,025	51,214	3,149
Number of structures.....	Number.....	110	260	370	7
Field planting or seeding (trees).....	Acres.....	260	7,469.6	7,729.6	
Forest stand improvement.....	Acres.....		2,333.5	2,333.5	
Nurseries.....	Man-days.....	7,895	41,820	49,715	283
Tree seed collection:					
Conifers (cones).....	Bushels.....	120	201	321	
Hardwoods.....	Pounds.....	2,559	13,621	16,180	
Fighting forest fires.....	Man-days.....	41,003	70,401	111,404	
Fire breaks.....	Miles.....	26.7	1,122.6	1,149.3	55.3
Fire hazard reduction:					
Roadside.....	Miles.....	327.9	461.2	789.1	
Trailside.....	Miles.....	185	411.3	596.3	
Other.....	Acres.....	17,918.9	41,492.4	59,411.3	
Fire suppression.....	Man-days.....	35,997	30,321	66,318	
Fire prevention.....	Man-days.....	326	3,257	3,583	
Tree and plant disease control.....	Acres.....	12,398.2	56,593	48,991.2	148
Tree insect pest control.....	Acres.....	45,778.3	64,275.5	110,053.8	9,371.4
Beach improvement.....	Acres.....	28.6	621.7	650.3	2
Fine grading, road slopes, etc.....	Square yards.....	1,724,222	5,392,790	7,117,012	10,500
Lake or pond site clearing.....	Acres.....	821	1,399.3	2,220.3	
Landscaping, undifferentiated.....	Acres.....	4,494.7	5,863	10,357.7	95
Moving and planting trees and shrubs.....	Number.....	726,341	1,959,656	2,685,997	520.7
Obliteration:					
Roads.....	Miles.....	34.5	124	158.5	
Trails.....	Miles.....	23.5	49.3	72.8	
Borrow pits.....	Man-days.....	19,941	111,055	130,996	
Parking areas and parking overlooks.....	Square yards.....	77,758	986,014	1,063,772	5,310
Public camp ground development.....	Acres.....	497.4	943.8	1,441.2	242.2
Public picnic ground development.....	Acres.....	157.4	1,222.6	1,380	219.8
Razing undesirable structures.....	Number.....	454	1,352	1,806	
Seed collection, flowers, grasses, etc.....	Pounds.....	1,801	14,673	16,474	
Seeding and sodding.....	Acres.....	1,228	3,031.2	4,259.2	4,477.8
Soil preparation (fertilizing, etc.).....	Acres.....	651.6	2,149.3	2,800.9	5.6
Vista or other selective cutting for effect.....	Acres.....	372.6	3,674.6	4,047.2	
Walks, concrete, gravel, cinder, etc.....	Linear feet.....	50,132	76,193	126,325	11,800
Fish-rearing ponds.....	Number.....	67	30	97	2
Food and cover planting.....	Acres.....	82.3	2,354.7	2,437	3
Lake and pond development.....	Man-days.....	3,237	58,694	61,931	

NATIONAL PARKS TABLE 13.—*Statement showing work accomplished at Civilian Conservation Corps camps under the jurisdiction of the National Park Service July 1, 1935-June 30, 1936—Continued*

Item	Unit	Total work accomplished from July 1, 1935, to June 30, 1936			
		New construction			Maintenance—national parks and monuments
		National parks and monuments	State parks	Combined total national parks and State parks	
Stocking fish.....	Number.....	4, 189, 400	749, 411	4, 938, 811	-----
Stream development.....	Miles.....	30. 9	38. 7	69. 6	-----
Emergency wildlife feeding.....	Man-days.....	637	-----	637	-----
Other wildlife development.....	Man-days.....	3, 670	16, 413	20, 083	247
Education, guide, and contact station work.....	Man-days.....	43, 148	8, 373	51, 521	-----
Emergency work—Searching for or rescuing persons.....	Man-days.....	348	3, 786	4, 134	-----
Emergency work—Other.....	Man-days.....	12, 734	286, 624	299, 358	-----
Eradication of poisonous weeds or exotic plants.....	Acres.....	2, 584	6, 750. 3	9, 334. 3	-----
Experimental plots.....	Number.....	42	99	141	-----
Insect pest control.....	Acres.....	57	880	937	-----
Maps: Type, topographic, etc.....	Man-days.....	3, 440	5, 463	8, 903	-----
Relief maps and models.....	Man-days.....	2, 656	1, 316	3, 972	-----
Marking boundaries.....	Miles.....	83	309. 5	392. 5	-----
Mosquito control.....	Acres.....	-----	2, 123	2, 123	-----
Preparation and transportation of materials.....	Man-days.....	67, 350	466, 610	533, 960	-----
Reconnaissance and investigation—Archaeological.....	Man-days.....	17, 893	12, 115	30, 008	-----
Reconnaissance and investigation—Other.....	Man-days.....	2, 582	12, 393	14, 975	-----
Restoration of historic structures.....	Numbers.....	455	57	512	-----
Rodent control.....	Acres.....	-----	2, 141	2, 141	-----
Surveys:					
Grade lines.....	Miles.....	162	718. 1	880. 1	-----
Ground water.....	Acres.....	97. 4	112. 6	210	-----
Lineal.....	Miles.....	1, 013. 3	2, 641. 9	3, 658. 2	-----
Topographic.....	Acres.....	16, 038. 5	73, 882. 8	89, 921. 3	-----
Type.....	Acres.....	537, 829	5, 876	543, 705	-----
Other.....	Man-days.....	3, 591	6, 551	10, 142	-----
Tree preservation.....	Man-days.....	27, 162	42, 551	69, 713	454
Unclassifiable.....	Man-days.....	19, 330	596	19, 926	-----

OFFICE OF INDIAN AFFAIRS

(JOHN COLLIER, *Commissioner*)

FOREWORD

An annual report on Indian affairs, were it adequate, would be a report on the whole life of a race. What follows describes governmental activities and only through shadowy implication reveals the forces of life working within the reviving Indian population of more than 230 tribes and bands.

For many decades the Indians were thought of, and they thought of themselves, as a dying race. Numerically they were dying. As battling groups they had lost their fight. As civilizations their day was ended.

Then very gradually but unmistakably the Indians' life-tide seemed to turn. The critical change goes back a decade and a half, or longer. Three years ago, the basis of Indian law was altered. Indian law had presumed the cessation of Indians. The changed law presumed their permanence and their increase. Indian Service, the Indians' mind, the general public's mind, became hopeful of the Indians' future. This future would be realized in terms of numbers increasing, not dwindling; of property-holdings increasing, not continuing to melt away; of cultural values preserved, intensified, and appreciated and sought for by the white world, and no longer treated as being significant only in terms of an outlived or crushed primitive world.

All of these evidences of new birth and new assurance have been forthcoming in the recent years, and never so richly as during the year just closed. The population record alone is an impressive one. Indians are increasing faster than any other group in the United States. Full-blood Indians are increasing at more than one percent a year. This, although the preventable morbidity rate is still excessive.

From 1887 to 1932, the average diminishment of Indian landholdings was 2,000,000 acres a year. Now, an increase is recorded at the rate of hundreds of thousands of acres a year. But the land-supply of fully half the Indians is all but hopelessly insufficient. Their economic level, by and large, is still the lowest in the United States.

The renascent Indian spirit has shown two great evidences. One of these is the universal, eager response of Indians to the opportunity to work, and their faithfulness and technical capacity when em-

ployed. The other is the adoption by more than 180 tribes of the Indian Reorganization Act, and their self-control and enterprise in organizing their common life under the authorities of the act.

There follows a condensed report of the Government's Indian Service activities for the year closed.

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INDIAN ORGANIZATION

The reorganization of Indian tribes has continued, with accelerated pace. The vote by tribes on the Indian Reorganization Act had been largely completed at the end of the fiscal year 1935, and in the year just ended the effort was devoted almost entirely to the building of constitutions and bylaws, and tribal charters. This phase of work under the Indian Reorganization Act is now well advanced, and the year 1936-37 should see an even greater progress.

Last year's report provided a brief history of the downward-spiraling trend of Indian resources and Indian morale from the passage of the General Allotment Act in 1887 to the enactment of the Indian Reorganization Act in June 1934. It might be useful to repeat here these facts:

Résumé of Indian Reorganization Act principles.—The present law prohibits further allotments and the selling of Indian lands except to the tribes; it restores to the tribes the unentered remnants of the so-called surplus lands of those allotted reservations which had been thrown open to white settlement; it authorizes annual appropriations for the purchase of land for landless Indians; provides for

the consolidation of Indian lands, and sets up a process which enables Indians voluntarily to return their individual landholdings to the protection of tribal status, thus reversing the disintegrating policy. Close study of the Indian Reorganization Act reveals that a greater part of the act deals with land, directly or indirectly.

Two other principles of the greatest importance are embodied in the act; namely, the right to the use of credit, by which tribal enterprises may be fostered, and the right to protection in self-government, by which Indian tribal life may be restored and perpetuated.

Organization goes ahead.—On June 30, 1936, 45 tribes had written, voted upon and accepted constitutions and bylaws, and all but three on that date had received official approval by the Secretary of the Interior. These 45 tribes represent an Indian population of 62,852. Five reservations, having a population of about 10,000, voted to reject the constitutions and bylaws written by their councils or constitutional committees. In such instances further elections must be held either on the same constitution or on revised drafts. The rejection of a constitution was usually the result of a local situation peculiar to the reservation, and the action of the tribe did not necessarily indicate dissatisfaction with the instrument voted upon or a reversal of attitude toward the Indian Reorganization Act. In one case the total vote cast was less than 30 percent of the voting population, and therefore another election must be held.

Indian vote is large.—In the annual report of last year, reference was made to the active participation and interest of the Indians in the referenda just then completed, and the fact that 62 percent of all the adult Indians came to the polls and cast their ballots. During the past year interest has not only been maintained but has increased. A few tabulations show that an even larger percentage participated in the elections on the constitutions and bylaws than took part in the referenda. For instance, constitutional elections for the four tribes under the Winnebago Agency in Nebraska were held in February during subzero weather, when roads were blocked by snow and ice; yet, under such conditions there were 338 more votes cast in the four elections on the adoption of constitutions than there were in the election on the act. The percentage of increase was 43 percent.

Constitution carefully drafted to meet local needs.—All of these constitutions and bylaws have some provisions in common; some few of them are near-duplicates of one another. Considering that certain underlying principles were included in each, that representative government was to be established, that certain enumerated powers were to be assumed, that land was to be protected; and considering also that legal phraseology tends to frighten men's thoughts into verbal stiffness, there still is discernible some considerable play of

tribal individuality in these documents. The instruments drafted by the San Carlos Apache Tribe and the Santa Clara Pueblo, to mention but two examples, are exceedingly interesting for the skillful way in which they give expression to local needs. It is of interest to note that in the State of Montana, South Dakota, North Dakota, and Nebraska, only two reservations among those which accepted the act failed to organize under constitutions and bylaws within this first year of active organization work. The voters of these two reservations (Standing Rock and Yankton) rejected the proposed constitutions, and their councils are now studying the problem of future procedure.

Incorporation of tribes begun.—Only one group, the Confederated Salish and Kootenai Tribes of the Flathead Reservation, had been incorporated at the close of the fiscal year, its charter having been ratified on April 25. At several other reservations election dates had been set, and active work was under way on 22 reservations. Incorporation of a tribe means that the tribe is in a position to apply for credit from the revolving loan fund, and that it can set up tribal enterprises to develop resources in land, timber, fisheries, etc. It is a goal toward which all tribes seriously interested in gaining some measure of economic self-sufficiency are striving.

New elections requested, but legislation required.—At the close of the fiscal year 1935, only a few tribes had not voted on the question of accepting or rejecting the application of the Indian Reorganization Act, and a few others fell into the category of those which had voted on the act but without 30 percent of the eligible voters participating. One tribe in this category, the Walker River Indians of Nevada, voted November 17, 1934, with only 20 percent of the eligible voters participating, and of those voting a majority was opposed to the act. A new election was called for June 17, 1936, and the result was a vote of 64 percent of the eligible list, with 62 percent of those voting favoring the act. If we may judge by the number of requests for a second chance to vote which have come from tribes which previously had voted to exclude themselves from the Indian Reorganization Act, it seems safe to assert that the Walker River experience would be repeated many times, if other tribes were allowed to vote again. These other tribes, however, had expressed their wills in elections in which 30 percent or more of the voting population had participated; hence, in accordance with the amendment to the Indian Reorganization Act of June 15, 1935, no further elections can be held on the subject without specific or general legislation on the part of Congress. As time passes, and the Indians gain knowledge and understanding of the benefits afforded by the act, their sentiment is swinging more and more positively toward the program of the administration.

The Alabama and Coushatta Indians of Texas, who had not previously voted, did so on June 17, 1936, at an election in which 84 percent of the eligible voters participated, and almost 100 percent were in favor of the act; to be exact, 123 votes were cast and 122 were in favor of it. A second instance of a tribe which had not previously voted was that of the Oneida Indians of New York, who voted on June 18, 1936, and, following the example of other New York tribes, voted to exclude themselves from the act. Finally, there are 11 small jurisdictions, mostly California rancherias, which either had not voted or upon which less than 30 percent of the members had voted. No requests for reelection came from these groups; consequently, they are accepted as being under the act.

There are now a total of 181 reservations and rancherias under the Indian Reorganization Act, representing a population of 133,000 Indians.

Reorganization Act extended to Alaska.—On May 1, 1936, the President gave his approval to the Alaska Act (Public, No. 538), which will “extend certain provisions of the act approved June 18, 1934 * * * to the territory of Alaska, to provide for the designation of Indian reservations in Alaska, and for other purposes.” This act will extend the organization and credit features of the Reorganization Act to the 30,000 Alaskan natives, who in the past have seen their land rights almost universally disregarded, their fishing rights increasingly invaded, and their economic situation grow each year more desperate.

Oklahoma Act embraces reorganization principles.—Of major importance likewise was the passage of the Oklahoma Indian Welfare Act (Public, No. 816), which was approved June 26, 1936, and which extends to the Oklahoma Indians the right to share in the program of self-government, corporate organization, credit and land purchase. These rights and privileges had been denied them in the legislation of 2 years ago. In addition to sharing in the revolving credit fund and land-purchase funds on an equal footing with other Indians of the United States, a special appropriation of \$2,000,000 was authorized by Congress for loans to cooperative associations and for other credit purposes. The Osage Tribe, wealthiest of all Indian tribes by reason of its tribal oil holdings, held in common, is excluded from the scope of the new law.

These two acts of Congress will make necessary an increased effort on the part of the organization division of the Indian Office. At the end of the year surveys had not yet been completed to indicate how extensive will be the work in these new fields.

Definition of an Indian raises problems.—Section 19 of the Indian Reorganization Act defines the term Indian to “include all persons of Indian descent who are members of any recognized Indian tribe

now under Federal jurisdiction, and all persons who are descendants of such members who were, on June 1, 1934, residing within the present boundaries of any Indian reservation, and shall further include all other persons of one-half or more Indian blood." The first two conditions of Indian status are quite clearly defined, but the third condition, that referring to Indians of one-half degree or more of blood, has made necessary the development of a research procedure the possibilities of which have not yet been fully explored.

Local initiative must be protected.—By the close of the year, the first fruits of tribal organization began to appear in the form of resolutions and ordinances from tribal councils. Many of these legislative acts, as provided for in tribal constitutions, require formal approval by the Secretary of the Interior; also, many new and unsolved questions of law and policy have arisen in connection with such tribal actions. It will be increasingly important, as organization takes effect among the tribes, that the Indian Office shall devise a new practice in Indian administration. The temptation will be great, on occasion, to make decisions in Washington on matters which, when referred to the Office or the Department for decision, should be returned to the point of origin for local action. With the best intentions in the world, the Office can in effect fasten a blight upon local self-government before it is ever an established fact. It will require sleepless vigilance on the part of the Office and of the Indians themselves to prevent any such unwanted anticlimax.

Mention has not yet been made of the need for educational follow-up work among those tribes which have organized themselves. It was not the least important by any means of the necessities which the closing year made apparent, and it will be among one of the first things of importance for some years to come. Administration can do much, but at best it can only make opportunity. The Indians must explore that opportunity and in time develop it; and in this we can offer friendly guidance; no more.

APPLIED ANTHROPOLOGICAL RESEARCH

The Indian Service has continued to make effective use of the findings of anthropological and other social-science research in working out practical problems in Indian administration.

In January, Dr. Scudder Mekeel, an anthropologist who had done considerable scientific work on contemporary Indian problems, succeeded Dr. Duncan Strong, who had been loaned by the Bureau of American Ethnology until a permanent man could be found to take charge of the Applied Anthropology Unit. Since Dr. Strong was called by his own organization to lead an expedition in Honduras,

the Bureau of American Ethnology has continued to cooperate by loaning, temporarily, Dr. Julian Steward to work with Dr. Mekeel.

A number of anthropological collaborators were sent out to various tribes. Their object has been to gather facts that will help to insure that the constitutions being drawn are based on the actual social organization and institutions of the particular tribe or group, thus giving reasonable assurance that such constitutions will become an integral part of tribal life. Also, collaborators were sent out to observe the workings of constitutions already accepted, so that any political or social conflicts could be noted and rectified early.

A physical anthropologist has been temporarily employed to assist in determination of the degree of blood of certain Indians who have petitioned to come under the Indian Reorganization Act through section 19.

INDIAN ARTS AND CRAFTS BOARD

The Indian Arts and Crafts Board was appointed just after the close of the fiscal year. Its membership consists of: John Collier, Commissioner of Indian Affairs, chairman (acting); Mr. E. K. Burlew, Administrative Assistant to the Secretary of the Interior (acting); Mr. W. W. Beatty, Director of Education, Indian Service; Dr. A. V. Kidder, of the Carnegie Institution of Washington; and Mr. Lorenzo Hubbell, of Oraibi, Ariz. A permanent chairman has not yet been chosen.

Mr. L. C. West has been appointed general manager, and Mr. René d'Harnoncourt as assistant to the general manager.

Briefly, the Board's powers are: (1) To undertake market research to determine the best opportunity for the sale of various products of Indian handiwork or manufacture; (2) to engage in technical research looking toward improvement of Indian products; (3) to engage in experimentation directly or through selected agencies; (4) to correlate and encourage the various governmental and private agencies engaged in similar activities; (5) to assist the management of operating groups in the furtherance of specific projects; (6) to assist appropriate agencies in obtaining loans to aid in the production and sale of Indian products; (7) to create Government trade marks of genuineness and quality for Indian products, and to establish standards for the use thereof; and (8) to license the use of such trade marks. The Board has no power to act as a dealer itself.

INDIAN JUSTICE ADMINISTRATION REORGANIZED

Since 1884, reservation Indians have been subjected to arrest, trial, and imprisonment by Indian Service officials and by judges chosen and removable by the superintendent of the reservation. This system

has been subject to continued criticism by Indians, by members of Congress, and by Indian welfare societies. Several earlier administrations initiated studies designed to reform the administration of justice on the Indian reservations, but none of these studies resulted in any substantial reforms.

Under the new law and order regulations, Indian Service Officials are prohibited from controlling, obstructing, or interfering with the functions of the Indian courts. The appointment and removal of Indian judges on those reservations where courts of Indian offenses are now maintained is made subject to confirmation by the Indians of the reservation. Indian defendants will hereafter have the benefit of formal charges, the power to summon witnesses, the privilege of bail, and the right to trial by jury. The offenses for which punishment may be imposed are specifically enumerated, the maximum of 6 months labor or \$360 fine being imposed for such offenses as assault and battery, abduction, embezzlement, fraud, forgery, misbranding and bribery. These offenses are not now punishable in any State or Federal court when the offense is committed on reservation land and when only tribal Indians are involved.

In addition to this criminal jurisdiction, the Indian courts will, in the future, have authority to handle civil cases between tribal Indians.

The revision of law and order regulations is one step in the program of the present administration to eliminate obsolete regulations and bureaucratic procedures governing the conduct of Indians, and to endow the Indian tribes themselves with increased responsibility and freedom in local self-government. Other Indian Service regulations which have recently been subject to critical revision are those dealing with the inheritance of Indian estates and with the use of Indian grazing lands.

These regulations are subject to modification in the light of local conditions by each tribe organized under the Indian Reorganization Act.

EDUCATION

Integration with community life.—During the past year a strong effort has been made to integrate Indian education more deeply with the actual living experiences and the environment of Indian children. With increased emphasis on community life, the school is becoming more and more the focal point for community interests and activities. No longer are classes held for the school children alone. The basis now is that of a parent-child cooperative program.

The school or community shop is becoming a popular place for the men to repair their tools; men and women come in to the school to sew, to bathe and wash their hair and clothes, for help on home

problems, to attend clinics, and, in some cases, at night to learn to read and write. Nursery schools have been established in a number of the older boarding schools. Child care is part of every older girl's training.

Parents contribute a wealth of information on spinning, weaving, and dyeing materials, in drying foods, and in making pottery, basketry, and leather goods, in conjunction with the general program which is being encouraged in all of the Indian schools and communities. An increased effort is being made to preserve the rich contribution which Indian arts and crafts have to make to the culture of future generations.

A concrete example of community interest is the Red Lake day school, near Leupp, Ariz., where a group of several Indian families, interested in home gardens, built and paid for an irrigation dam, by means of which an ample food supply was provided for their school and community.

This changed emphasis on the interrelationship of school and community life is true not only of the day school but of many of the boarding schools as well. Greater emphasis is being placed on more practical work, such as special agricultural and homemaking courses. At one school, 3-week short courses were provided throughout the year for mothers and girls in outlying communities. School and home gardens have been made by children and teachers. School hothouses and hotbeds provide tomato, cabbage, berry, and flower plants for the homes. Poultry clubs are a part of many homemaking courses. Home furnishing increasingly is taught in terms of the homes from which pupils come. The furniture and furnishings are simple, but of a practical and durable type that can be made and paid for by an energetic homemaker.

A caution must be imposed on those schools which are situated in tribes whose archaic pattern of culture and government still persists, along with archaic moral and economic customs and sanctions and with prestige systems coming down from old time. To shift to the community school the prestige and responsibility now vested in the native institutions might easily, and almost unconsciously, blight the as yet undestroyed ancient values and kill the energies which have served practical and spiritual need for many ages. The all-embracing community school distinctly is not indicated for such complex, self-contained, and traditionally potent small-group situations as are represented by many of the Pueblo tribes. Here, the program must be self-restrained and very tentatively experimental. Meantime, in such situations there is abundant work for the school which only supplements and in no manner supplants the "native" resources.

Exhibits of arts and crafts.—The contemporary arts and crafts of the Indian have been brought before the public during the year through the interest taken by the Interior Department in the Texas Centennial and the Great Lakes Expositions. The exhibits collected for this purpose will become a valuable part of a permanent Indian collection to be used in promoting further arts and crafts activities.

Health education.—In keeping with general educational trends, an attempt is being made to develop health education through all departments and agencies concerned with Indian life. An effort is being made to utilize opportunities in health instruction as they occur in the daily activities of community centers and boarding schools, as well as of clinics, sanatoria, and hospitals. Teachers and Indian assistants are participating increasingly in the educational phases of health supervision. Special training for this purpose was made a part of the summer institute program.

Trades, industrial, and agricultural training.—Improvement is being made in the trade, industrial, and agricultural training courses and types of training for both young people and adults.

Instructors of agriculture have been added to the teaching staffs of several reservation schools, making possible development of training programs organized around the type of agriculture or animal husbandry dominant in the various communities. The programs include development of individual student farm projects on Indian school land and on land owned by the students or their parents.

Trade and industrial training programs are being reorganized particularly at reservation schools and community day schools to stress the acquisition of skills which are bound to be a part of the experience of the students in later life in their own environment.

Indian girls and adults, both men and women, are being encouraged to participate in the training programs arranged in these fields of education to meet local needs.

At the Phoenix Indian School training for adults in operation, maintenance and repair of tractors has been established on an individual training basis under a competent instructor. Adult students are admitted to this school under a reasonable tuition plan when it is shown that they can profit by such training. This school admits students from all parts of the country.

Traveling library and visual education.—A beginning has been made in the establishment of an interjurisdictional traveling library and visual education service in southern Arizona to insure full utilization of library and educational resources. The day schools of one or two jurisdictions are to be used experimentally as centers for the distribution of books, magazines, visual education material, music records, and other library material which will be circulated to adults

as well as students. A specially constructed book and motion-picture truck has been designed to serve these purposes. The service will also bring educational and entertaining sound motion pictures and radio broadcasts to Indian communities. The central library has been established at the Phoenix Indian School, Phoenix, Ariz., under a competent librarian, and the visual education and motion-picture activities will be carried on by a specialist in this field. Other Indian reservation areas throughout the country are being studied with the possibility in view of extending similar services.

Attendance in public schools.—The number of Indian children attending public schools is increasing. In most cases, the Federal Government pays tuition in order to secure adequate education facilities. A multiplicity of factors presents an ever-changing problem in determining what part the Federal Government should assume in support of public schools. Among the more important are: (1) Type and quality of school actually maintained; (2) amount of money needed to maintain a suitable school adapted to the needs of Indian as well as white children; (3) amount and value of nontaxable Indian lands; (4) methods of taxation; (5) amount of State support for education; (6) basis of distribution of State support; (7) maintenance and capital outlay costs; (8) changing legislation affecting school finances; (9) distribution of Indian children; (10) attitude of whites toward Indians; (11) social backgrounds; (12) economic conditions of Indians. In some States funds paid for tuition are used primarily to provide services of special benefit to Indian children. In certain sections of the country, due to adverse economic conditions, it is necessary to furnish lunches, and sometimes clothing, for children in public schools. This service results in increased attendance and a better quality of work. In some areas seriously affected by adverse economic conditions, it has appeared wise for the Indian Service to reassume responsibility for the operation of schools at one time run by local officials.

The problems vary greatly in the different States, from conditions in Oklahoma, where more than 75 percent of the Indian children attend public schools to those in Arizona, where the percentage is very small. In Oklahoma, the number of Indian children is 5 percent of the total scholastic population, and more than 4 percent are enrolled in public schools. In Arizona, the number of Indian children is 11 percent of the total scholastic population, and only 6 percent are enrolled in public schools; the majority of the children are in Government Indian schools.

Traveling mental hygiene clinic.—The special handling of handicapped and problem children has become an increasing challenge to the Indian Service as its personnel has become more sensitive to the

needs of this group. In the Indian's native culture, handicapped children were cared for by the community, with neighbors and relatives sharing in the provisions for their comfort. As this culture has been demoralized or stripped of responsibility by the infringement of a foreign culture and the past oppressions of governmental policy, social controls and community organizations have tended to break down, necessitating an increasing amount of care for handicapped children on the part of the Federal Government.

The problems presented by the mentally defective, physically handicapped, incorrigible, and dependent children in Oklahoma have been found to be so acute that establishment of a special institution has been recommended. To analyze the problems and to see just what classes of children should be cared for, representatives of the Indian Service, in cooperation with Dr. Forrest N. Anderson, director of the Los Angeles Child Guidance Clinic, as psychiatrist, and psychologists from the University of Oklahoma and Northeastern State Teachers College, spent 9 weeks holding clinics in various parts of Oklahoma. School social workers, education field agents, and teachers in boarding schools referred 540 cases to these clinics for various reasons, given approximately as follows: Inability to make normal school progress, 25 percent; truancy, 15 percent; physical and health handicaps, 15 percent (more than twice this number were found to need medical care); general loose type of behavior (restricted to older adolescents, consisting usually in drinking, promiscuous sex relations, loafing, refusal to attend school, and anti-social conduct such as thievery), 20 percent; mental and emotional handicaps, 15 percent; and miscellaneous behavior problems, of which stealing was the most prominent, 10 percent. Half of the cases referred to the clinics were between 14 and 18 years of age. Complete examinations were made of 235, and 75 more were examined partially.

The most important causal factor in all of the cases presented is the demoralization and disintegration of economic and social life. Two-thirds of the children referred to the clinic come from broken homes caused by the death of one or both parents, divorce, separation, or desertion. Emotional instability is present in at least half of the homes studied. The situation is basically an economic one: many Indians in the State live in abject poverty. Other causes of misbehavior include parental indulgence, low degree of mentality, inability of rural schools to secure skilled personnel and modify their programs to meet the specialized needs of such children, and the absence of suitable community life.

After conferring with a large number of field workers and viewing the problems from many angles, the clinic recommended: (1) Estab-

lishment of a special institution, or separate unit in an existing institution, for children above the level ordinarily committed to State homes for feeble-minded, but sufficiently dull to need special training; (2) provision for permanent clinical psychiatric and psychological service; (3) adaptation of boarding-school programs to give older retarded boys and girls the necessary training to make a living and to make good homes; (4) establishment of an opportunity class, or special ungraded class at each boarding school (some are already functioning within the State); (5) provision for better hospitalization at schools not having needed facilities; and (6) provision for home placement.

Social work.—The recognized scope of school social work, introduced into the Indian Service in an effort to reduce institutionalization of Indian children in boarding schools and to assist in their adjustment in home and public school, is expanding as it becomes increasingly obvious that the welfare of the school child cannot be isolated from the general welfare of the group of which he is a part. The school social worker, therefore, finds a fundamental approach to the needs of the school child through participation in the general program of the jurisdiction, concerned as it is with economic rehabilitation and with the organization of Indians for self-maintenance and self-direction as well as with education and family welfare. The jurisdictions, in turn, are finding value in the application of social work principles and techniques to various phases of jurisdiction work, much of which is essentially welfare work.

With the reduction in boarding-school enrollments, provision for the care of dependent Indian children was essential. Children who could not be cared for by friends or relatives have been placed in foster homes through public or private agencies and, in a few instances where no adequate foster-home program could be instituted, some have received care in small dormitories, usually run by missions, from which they attend the local public schools. For 2 years a contract has been in effect with a private agency in the State of Michigan, the Michigan Children's Aid Society, to provide placement and supervision in boarding homes for dependent Indian children for whom suitable care could not otherwise be provided. In California the arrangements are made for individual children in cooperation with the county and the State. The Oregon placement program has been under the supervision of our State superintendent of education, who obtains such assistance as is available from local agencies.

Recently the first contract between a State and the Indian Office for social services was made with the State of Wisconsin. A type of service similar to that mentioned above is now provided for Wisconsin Indian children through the foster-home division of the

State public schools. Child welfare services of the juvenile department of the Wisconsin State Board of Control are extended to Indians throughout the State. State workers and county children's boards are already showing increased interest in discovering the needs of, and planning for, the welfare of Indian children; and efforts are being directed toward improvement of family and community conditions and the provision of recreational outlets in an attempt to reduce delinquency and to promote child welfare.

The United States Children's Bureau, cooperating with the Indian Service, has appointed a special worker to study present child welfare work in the Indian Service and to plan means of extending to Indian children those services available under the Social Security Act and administered by the Children's Bureau; namely, maternal and child health services, child welfare services, and services to crippled children.

During the year three young Indian women—a Cherokee, a Choctaw, and a Chippewa—who had been employed as Indian assistants qualified for classified positions by further social-work training and experience. Two of these became school social workers and one an assistant community worker.

Educational loans.—For some time there has been a growing awareness on the part of those concerned with Indian education of the necessity for trained native leadership if Indian education is to be a reality to the Indian people. One of the major objects before us has been to secure for Indians the technical and professional training necessary for the successful handling of their own affairs. Toward this end Congress appropriated in 1935, \$175,000 under the Indian Reorganization Act, for scholarship loans to Indians, and a gratuity fund of \$15,000 for the payment of tuition and fees in nonsectarian schools. Thirty-five thousand dollars of the total amount appropriated for loans was available for education in high schools and colleges and \$140,000 for training in recognized vocational schools.

Candidates for scholarship loans are recommended by local educational loan committees from each reservation. An effort is made to search out the most able and promising young people for advanced training. Loans are made on a competitive basis, on recommendations made by the reservation loan committees. Preference is given to those students having the higher degree of Indian blood, other qualifications being equal.

While there has been a small educational loan fund available in the past, we have been able for the first time, this year, to meet in anything like adequate measure the demand for the training of native

leadership. As against a total of 204 students in colleges and vocational schools in 1935 it has this year been possible to aid 399 students to attend colleges, universities, and vocational schools. A majority of these young people have held their own in competition with white students, often in spite of inadequate scholastic preparation and the handicap of differences in language and environment. Many have lacked the understanding and backing of their people at home and the understanding and appreciation of those with whom they must live and work. For many of these students, it is a pioneering job, and they have given a good account of themselves.

The great majority of those receiving scholarship loans are hoping to return to work among their own people. This year nine Indian loan students completed training to become teachers, six were trained as nurses, four as teachers of home economics, and one as a social worker. These will be offered opportunity to enter the Indian Service on an apprentice basis. There are 42 different courses being taken by educational loan students from 30 States; the total number having educational loans was 399; the total in college, 258; the total in vocational schools, 141. The distribution by degree of blood was as follows: Full bloods, 104; less than full blood but one-half or more, 173; less than one-half but one-fourth or more, 121.

Indian primers.—It has long been recognized that there was a dearth of textbook material suitable for the specialized Indian education program. Plans have been under way for development and publication of materials dealing with subject matter in a manner applicable to the particular needs of the Indian child. Miss Rose K. Brandt, supervisor of elementary education, has been detailed for a period of time to work exclusively on the preparation and publication of a series of primers for Indian children. The first of these, *Feast Day in Nambe*; *Shaker, Our Monkey*; and *Shaker's Health Book*, have just recently been completed and printed as student projects by the Haskell Institute and Chilocco printing departments. The selections have been written by the Indian children themselves in a class project and have been edited only slightly. The linoleum block illustrations were made by some of the older children at Santa Fe school and give a pictorial description of the subject matter. Other books of the series are in process of completion and additional work in this field, embracing work in mathematics and social science, is contemplated for this coming year.

The Alaska school service.—Mr. Claude M. Hirst was appointed director of education for natives of Alaska and entered on duty in March 1936. He has supervision of the 99 day schools and 2 boarding schools conducted by the Office of Indian Affairs for the Indians and Eskimos.

All schools were in operation during the past year, although a few started late because of the difficulty of securing transportation for new appointees to their isolated posts.

During the past year the Alaska Service was brought under civil-service regulations, and new appointees are now selected from appropriate civil-service registers of eligibles. Community workers, qualified to teach, are being appointed at isolated stations. The day schools in Alaska are extremely isolated, and it is necessary that the teacher (or community worker) serve as physician and nurse, and supervisor of gardens, cooperative stores, reindeer activities, marketing of furs, purchasing supplies, recreation, economic enterprises, and village government. Greater emphasis is being placed upon the development of native arts and crafts as a part of the educational system.

There is urgent need for replacement of shacks which, in many instances, now serve as schools and teachers' quarters. There are about 25 villages with 25 or more children of school age in each, which have never been provided with schools. Appropriations for salary for community workers for two new schools (Minto and Nanavanaglak) have been secured for this coming year.

Mr. Frank Daugherty, teacher at the Point Barrow school, was detailed to make a survey of conditions from Point Barrow east to Demarcation Point, due to reports of an epidemic of mumps and shortage of food and fuel. Marauding wolves have greatly decreased the reindeer herds in this region. The emergency situation was handled locally. This office is cooperating with other Government agencies in helping the natives in their battle against the wolves. Mr. Daugherty was the first Government official to go beyond Flaxman Island since the cutter *Bear* set the boundary mark more than 20 years ago. His report is eagerly awaited.

HEALTH

Increased appropriations for the fiscal year 1936 (\$3,486,085 for 1935; \$4,011,620 for 1936) have made possible real progress in Indian health work. Personnel has been enlarged in the badly understaffed hospitals and field service; new hospitals are being built and others are being remodeled; and the basic task of preventive work is at last being measurably accomplished.

New personnel.—The personnel was increased to 160 full-time and 76 part-time physicians, 378 staff nurses, 105 field nurses, 15 nurses at large, 1 special expert in tuberculosis, 2 special physicians (tuberculosis), 13 full-time dentists and 13 part-time dentists, and 673 other miscellaneous health personnel. There are also employed seven special consultants.

New hospitals.—During the year a new hospital with a capacity of 38 beds was completed and opened to receive patients at Colville, Wash. This institution is modern in construction and equipment and already is doing splendid work. It is fully staffed to serve surgical as well as general cases.

On June 30, 1936, there were under construction 12 hospitals, located as follows:

	<i>Bed capacity</i>
Fort Yuma, Ariz.....	25
Cass Lake, Minn.....	34
Blackfeet, Mont.....	45
Crow Agency, Mont.....	30
Western Shoshone, Nev.....	20
Zuni, N. Mex.....	34
Cherokee, N. C.....	28
Warm Springs, Oreg.....	21
Crow Creek, S. Dak.....	24
Yankton, S. Dak.....	25
Sisseton, S. Dak.....	34
Fort Duchesne, Utah.....	24

Remodeling and enlarging projects were carried on at:

	<i>Additional beds</i>
Taos, N. Mex.....	8
Standing Rock, N. Dak.....	17
Claremore, Okla.....	40
Kiowa, Okla.....	25
Rosebud, S. Dak.....	17
Cheyenne River, S. Dak.....	6

The above-mentioned projects are in varying stages of completion. When all are completed, they will add approximately 325 beds to the present Indian Service hospital capacity.

There has been a vast improvement in both construction and equipment of Indian Service hospitals during the past few years. The newer institutions have been constructed of fire-resisting material and have been fully supplied with modern equipment. Even with these new facilities, the need for hospitalization is far beyond existing or early hoped-for capacity.

Excluding infirmaries of less than 10 beds capacity, there were in operation this year 91 hospitals and sanatoria, with a capacity of 3,743 beds, 109 cribs, and 267 bassinets. Of this number, 15 are sanatoria, with 1,257 beds.

Indian birth and death rates.—During the fiscal year the Indian birth rate, as shown by reports admittedly incomplete, was 24.3 per thousand, and the death rate was 15.1 per thousand. In 1911 the Indian death rate was reported as 35.6 per thousand and the birth rate 36.1 per thousand live births. The present balance of 9.2 addi-

tional to each 1,000 denotes a population increasing, and not vanishing.

Health surveys; anti-tuberculosis vaccination.—A survey begun last year at Pima and Papago in connection with the tuberculosis campaign there has been continued and the follow-up work undertaken. Surveys have been extended to Shoshone, Wyo., and Blackfeet, Mont. At both these reservations there are now special physicians working under the direction of Dr. Joseph D. Aronson, special expert in tuberculosis, in carrying out the tuberculosis program inaugurated a year ago.

During the past year, Dr. Aronson has administered B. C. G. vaccination or given control injections to about 500 tubercular-negative school children on the Papago Reservation. The infants and preschool children will be attended to later. He has applied the tuberculin test to approximately one-half of the population (5,000) on this reservation, and has completed a fairly accurate mortality census.

From April 18 to 25, tuberculin tests were conducted on school children in Hennepin County, Minn., by Dr. Aronson in conjunction with the State health authorities. A total of 1,301 tests were performed in this area.

Dr. Aronson is at present making a preliminary survey of the tuberculosis situation at the Shoshone Indian Agency, Fort Washakie, Wyo.

In addition to the above-mentioned surveys, there was also made a survey at Zuni and at Taos by Dr. William Palmer Lucas, a specialist in child hygiene and nutrition; and a survey in Oklahoma covering the mental condition of children of school age. Two counties in Oklahoma were surveyed for general health conditions, and a dental survey was made in Alaska. Figures from these latter-mentioned studies are not yet available. Cooperative relationships have been entered into with the Oklahoma State Board of Health in the development of a five-county, full-time district health unit. This gives to approximately 25,000 Five Tribes Indians a full-time adequate health service.

Cooperative work has continued with the Public Health Service in a survey of the basillary dysentery infection among the Pueblo Indians of New Mexico. Preliminary reports show among the Pueblo Tribes a high infestation rate, ranging from 14 to 40 percent.

Dental clinics on wheels.—Two additional mobile dental clinics were supplied during the year, which will enable the traveling dentists to whom they have been assigned to accomplish a great deal more work for the Indians under very much improved conditions. To each of these clinics is assigned a young Indian who has had

training to fit him to assist the dentist and to act as driver and mechanic for the automobile.

Trachoma school.—For the past 2 years the Health Division has operated a trachoma school at the old Theodore Roosevelt School site in the Whiteriver Apache jurisdiction. Here a concentrated effort has been made to gather together and treat as many as possible of the trachomatous Apache children of school age. Specially trained physicians and nurses are giving them intensive treatment in order to effect cures in as short a time as possible. Results have been most encouraging. During the first 10 months of the past year there were treated for trachoma in this institution 222 patients, of whom 108 were discharged as cured or improved and 4 unimproved. Of those being treated for other eye conditions, 32 were discharged as cured or improved and 2 unimproved. This undertaking will be continued here at least for the present, and will be extended to other jurisdictions wherever conditions will permit.

Dr. Francis I. Proctor, trachoma consultant to the Indian Service, died July 8, 1936. His death is a great loss to the medical field in general and to the Indian medical work in particular. He was untiring in his efforts to assist in eradicating trachoma from the Indian race.

Preventorium for underweight children.—At Fort Totten, N. Dak., advantage has been taken of the building space made available by the closing of a boarding school to establish a preventorium, in which 50 undernourished children have been placed under observation. Every effort is being made to bring them up to normal physical condition, and frequent examinations are made to detect the possibility of tuberculosis in its very early stages. The success of this institution has been so marked that we shall double the number of children there in the coming year.

Nursing service.—There has been some increase in the number of nurses in the hospital service. Many of the institutions are still much understaffed, however, and the increase of the hospital utilization has made the need for more nurses acute in certain locations.

The school for ward attendants which was opened in the fiscal year 1936 graduated 17 students this June. Girls with this type of training will be of great assistance to the nurses in the understaffed institutions. They will be assigned to the simpler types of nursing duties under the supervision of the graduate nurses, thus enabling the graduate nurses to give more care to the seriously ill patients. Reports on these students have been very encouraging; they have shown interest, initiative, and adaptability. Three of these graduated students have already been assigned to duty and positions will be established to provide employment for the remaining 14. There

have been requests for these students in various sections of the country.

There has been an increase in the employment of Indian girls who are graduate registered nurses. There are now 56 Indians on the nursing staff as compared to 42 last year at this time.

The field nursing program covering control of communicable disease, maternity and infancy hygiene, and health supervision, has been continued. The increase in demand for this type of service shows a constructive attitude and interest in the community health program.

Three field nurses have been assigned to duty on a cooperative basis with the five-county health unit in eastern Oklahoma. This is the first service of this kind provided for the Indians of these counties.

Three nurses were assigned to the special tuberculosis program. Two of these had post-graduate courses at Phipps Institute in order to prepare for this work. One of the staff nurses at the Shoshone Hospital is taking a course in X-ray technique in order to assist in the tuberculosis program being carried out at this reservation.

There has been an increase in the number of trachoma nurses. Several nurses have taken special post-graduate courses in order to qualify better for this work. The special nurses in eye work are teaching the staff nurses eye nursing work, under the direction of the supervisory trachoma nurse, while on detail to the various hospitals. It is hoped that in this way the demand for nurses who have special preparation in trachoma nursing will eventually be met. It was not possible to secure a sufficient number of nurses qualified to do trachoma work from the Civil Service register and we therefore found it necessary to promote a type of in-service training. The majority of the nurses who at this time are assigned to trachoma work have learned this branch of nursing since coming into the Indian Service.

Nursing-school survey.—Arrangements have been made to have a survey made by the National League of Nursing Education concerning the feasibility of establishing a school of nursing at some one of our larger institutions, such as Fort Defiance or the Kiowa Hospital. There are social as well as educational values to be considered. This association is recognized as thoroughly familiar with the standards of nursing service as well as education and has therefore much to contribute to a critical examination of the effectiveness of our work. To bring to the Indian Service the standards recognized as essential by the best authorities in the medical world has an invigorating influence on our planning and development.

Alaska medical service.—In August 1935 Dr. J. F. van Ackeren was detailed by the United States Public Health Service as director of the Alaska Medical Service, with headquarters at Juneau, Alaska. Dr. van Ackeren has familiarized himself with the Alaska work dur-

ing the past year by visiting the six native hospitals and as many as possible of the 23 field-nurse stations.

Miss Elinor D. Gregg, director of nursing for the Office of Indian Affairs, made a trip to Alaska during the fall of 1935 to acquaint herself with the needs of the Alaska Service. Miss Bertha M. Tiber, formerly field nurse at Wainwright, has been appointed supervisor of nurses for Alaska and is planning a better organization of the Alaska nursing service. Appropriation for the salaries of two additional field nurses has been secured for the next year.

Dr. Taylor J. Pyle, formerly traveling dentist in the Alaska service, has been made supervisor of the dental work; and contracts are being made with the local dentists whereby dental service will be rendered to the natives on a fee basis. This plan will save the Government many thousands of dollars in traveling expenses.

The Presbyterian Mission Board has turned over to the Office of Indian Affairs its hospital at Point Barrow, Alaska. An appropriation has been secured for repairs and supplies, and for salaries of two nurses and a physician. Arrangements are under way for the taking over of this hospital by the Indian Office July 1, 1936.

No progress has been made in securing new hospitals for Alaska. Hospitals are particularly needed at Bethel on the Kuskokwim, at Ketchikan, and at Seward. New buildings are urgently needed at Kanakanak and Kotzebue; the present buildings are in such a dilapidated condition that it is impossible for a hospital staff to render adequate service.

Cooperation with other organizations.—The cooperation heretofore maintained with the United States Public Health Service, with the usual detail by them of personnel to the Indian Service, has been in effect throughout the fiscal year 1936.

The death of Dr. C. T. Messner, our dental officer (who was detailed from Public Health), was a serious loss to Indian medical work.

Cooperation with other organizations has been continued, and further cooperation with local health organizations is being developed. This refers especially to the five-county cooperative arrangement that is now being worked out with the State health officer of Oklahoma.

EXTENSION AND INDUSTRY

This division works toward better living standards for Indians, by seeking to teach the wise use of their physical resources. Its programs are tied closely to local reservation problems and assets, and they are worked out in cooperation with the Indians.

Indian extension work made progress in 1935, but has not yet fully recovered from the effects of the 1934 drought. The crop year was below normal on most reservations.

All of the figures which follow are for the calendar year 1935, and consequently do not show the losses which will follow from the 1936 drought. These losses, from reports received at the end of the fiscal year, will be tragically severe on the Dakota and eastern Montana reservations, and in eastern Oklahoma.

Cattle.—Arrangements were effected with the New Mexico Rehabilitation Corporation whereby approximately 8,800 head of cattle were turned over to Indians, the greater part of which were distributed on northern reservations which were drought-stricken in 1934.

Many of the drought-relief cattle received from the Federal Surplus Relief Corporation during 1934 were found to be unsuitable for foundation herds, and a decrease of 6 percent in the number of Indians owning dairy cattle, and a decrease of 18 percent in the number of animals owned was recorded due to such losses. The number of Indians owning beef cattle remained practically stationary during the year. The number owned increased approximately 2 percent. These figures should be considered with the fact that 8,482 head were slaughtered during the year and 44,766 head were sold.

	Dairy cattle			Beef cattle		
	1933	1934	1935	1933	1934	1935
Number of Indians owning.....	6,336	9,133	8,556	8,627	13,787	13,812
Total number owned.....	16,406	25,711	26,966	167,313	229,343	233,974
Average value per head.....		\$23.07	\$37.85		\$18.95	\$31.10
Total value.....		\$593,127	\$793,526		\$4,346,307	\$7,276,265
Number of live animals sold.....	252	2,171	1,001	12,284	36,046	44,766
Amount received.....	\$3,603	\$36,008	\$22,229	\$210,609	\$578,070	\$1,365,875
Pounds dressed meat sold.....		3,500	10,151	793,063	547,179	880,947
Amount received.....		\$245	\$1,235	\$52,486	\$44,820	\$86,114

Total income received from cattle: 1933, \$266,698; 1934, \$659,143; 1935, \$1,415,453.

The increased income from beef cattle was due, in part, to improved market conditions.

A strong effort was made to have Indian cattle owners become members of cooperative livestock associations. A total of 53 such organizations were in operation at the close of the year.

Sheep and goats.—The overgrazed condition of the Navajo range demanded additional reduction in the numbers of sheep and goats in that area. The dipping records of the Bureau of Animal Industry show the following comparative figures in the number of sheep units:¹ 1933, 1,013,606; 1934, 942,059; 1935, 801,406. The revised

¹ The term "sheep unit" here includes grown sheep, lambs, rams, goats, and kids. Lambs and kids are figured on the basis of two for one grown animal. The term does not here include cattle and horses.

dipping records of the Soil Conservation Service show a still further reduction to 795,789 sheep units at the close of the year. There is need for still further reduction.

In spite of the decrease in the number of sheep in the Southwest, increases were recorded throughout the Service as a whole.

	Sheep			Goats		
	1933	1934	1935	1933	1934	1935
Number of Indians owning.....	7, 527	9, 213	8, 714	5, 842	7, 681	6, 296
Number owned.....	1, 051, 079	901, 765	1, 005, 345	353, 190	215, 566	158, 119
Number of live animals sold.....	94, 226	156, 571	207, 528	2, 654	150, 884	23, 480
Pounds dressed meat sold.....	202, 530	101, 450	85, 693	43, 625	31, 450	47, 685
Amount received from sales of live animals.....	\$306, 652	\$366, 546	\$738, 680	\$3, 872	\$156, 478	\$41, 588
Amount received from sales of dressed meat.....	\$18, 240	\$9, 686	\$11, 036	\$5, 672	\$2, 786	\$4, 059

¹ Includes proceeds from drought purchases of Federal Surplus Relief Corporation.

Amount received from wool and mohair sales: 1933, \$460,635; 1934, \$505,919; 1935, \$549,506.

Total income from sheep and goats: 1933, \$795,071; 1934, \$1,041,815; 1935, \$1,344,869.

Swine.—The swine project continued to show effects of the 1934 drought. The number of Indians owning swine decreased 16 percent and the number owned decreased 7,980, or about 25 percent, from 1934. Over 60 percent of the swine owned are on Oklahoma reservations.

Horses and mules.—Better bred horses are greatly needed on many reservations. A total of 66 purebred stallions and 2,463 mares were purchased. In some sections there are far too many wild horses which use range that should be put to more productive use. A total of 11,512 horses were sold during the past year. At the close of 1935, a total of 41,543 Indians owned 133,482 horses.

Poultry.—Indian poultry raising continued to show the effects of the 1934 drought. Efforts were directed mainly toward encouraging poultry raisers to supply fresh eggs for family use, and some birds for consumption rather than for commercial activities. Turkeys, however, are grown for the commercial market.

	1933	1934	1935
Number of Indians owning.....	18, 322	19, 638	16, 823
Number poultry owned.....	356, 139	363, 384	341, 603
Number live birds sold.....	61, 932	73, 013	86, 773
Pounds dressed poultry sold.....	55, 161	77, 946	59, 564
Amount received from sales dressed poultry.....	\$10, 356	\$16, 745	\$15, 799
Number birds slaughtered for family use.....	78, 640	90, 291	118, 630
Estimated dozens eggs produced.....		1, 357, 774	1, 397, 485

Navajo sheep-breeding laboratory.—An appropriation of \$60,000 was made for the establishment and \$15,000 for the operation of a sheep-breeding laboratory on the Navajo Reservation. Efforts will

be directed towards building up a breed of sheep adapted to Navajo Reservation climatic conditions, whose wool will be suitable for the making of Navajo rugs, and at the same time salable on the open market. This work was carried forward in cooperation with the Department of Agriculture.

Farming.—While the 1935 season was below normal in most sections, there was considerable recovery from the 1934 drought. The total acreage cultivated by Indians was 583,452.46, an increase of approximately 14 percent over 1934. The acreage planted in various cereal crops showed an increase of 3.36 percent over 1934, while yields increased 84 percent. Cotton yields increased 64 percent, and sugar beets 111 percent over 1934. The acreage of forage crops remained practically stationary, but yields showed an increase of 55 percent. A total of 27,956 families planted 28,624 acres of gardens. Production of various garden products showed a considerable improvement over 1934, examples being potatoes, 20 percent; corn, 107 percent; squash, 55 percent; tomatoes, 78 percent.

Horticultural projects continued to make progress. Yields of tree and vine fruits showed an increase of 168 percent. A total of 6,243 fruit trees was set out on various allotments during the year. Yields of small fruits showed a 53 percent increase, and 18,144 new units were planted.

4-H club work.—This work is valuable not only in giving boys and girls training in better agricultural and homemaking practices but also as a demonstration to the parents of the value of improved practices.

	1932	1933	1934	1935
Total members enrolled.....	3,871	4,375	4,290	5,138
Total members completing.....	2,871	3,195	3,128	3,566
Number different members enrolled.....	3,336	3,324	3,581	4,261
Number different members completing.....	2,467	2,398	2,511	3,197
Percentage of completions.....	74.16	73.02	72.91	69.04
Number of clubs.....			294	334

Home extension work.—Home extension projects continued to make progress during the year. Canning projects showed the following results in quarts: Fruits, 501,112; meats, 65,950; vegetables, 435,170; and fish, 45,326. Drying projects showed the following results in pounds: Fruits, 221,974; meats, 558,985; vegetables, 740,969; fish, 156,400. It is estimated that we assisted 7,721 homes in canning projects and 5,754 homes in drying projects. A total of 108,818 pieces of clothing were made and 2,700 homes were helped in clothing activities. A total of 1,633 homes adopted improved nutrition practices.

Farm and home building.—Construction and remodeling of farm and home buildings continued to receive attention. A total of 1,286 new dwellings were constructed at an estimated cost of \$488,295, and 1,800 were remodeled with an estimated resulting increased value of \$226,050. A total of 477 new barns, 136 hog houses, 298 poultry houses, and 119 granaries were constructed. The project on sanitation of home surroundings resulted in the building of 810 toilets.

General extension work.—The following figures summarize general extension work:

Extension workers made 142,711 farm and home visits during the year. A total of 336,314 office and 78,779 telephone calls were received. Workers wrote 72,641 letters; prepared 1,481 circulars, of which 90,614 copies were sent out; and distributed 43,330 bulletins. Exhibits were shown at 1,422 events; 190 meetings were held for local leaders, at which 2,587 were in attendance; 3,383 demonstration meetings held, with an attendance of 41,230; 198 tours conducted, with an attendance of 1,666; 118 achievement days held, with an attendance of 27,417; and 4,325 other extension meetings held, with an attendance of 100,409. Local leaders held 2,540 meetings, with an attendance of 82,120. All meetings held during the year totaled 12,452, with a total attendance of 82,129.

Cooperation with other organizations.—Close cooperation was maintained by extension employees and workers of other divisions. Employees of the Education Division were very helpful in promoting 4-H club work and home extension activities. County and home demonstration agents were also of assistance in forwarding the program of work. The agricultural colleges in the various States, the State relief and rehabilitation corporations, the Department of Agriculture, and the Resettlement Administration also rendered valuable assistance. On Southwest reservations, efforts were directed toward working closely with the Soil Conservation Service.

Revolving credit fund.—Administration of the credit revolving fund authorized by the Indian Reorganization Act was placed upon the Extension Division. The act authorized a fund of \$10,000,000, of which \$2,500,000 was appropriated in the 1936 Budget. Of the appropriated amount, \$50,000 was authorized for administrative expenses. An additional \$2,000,000 was authorized by the Oklahoma Indian Welfare Act of June 26, 1936 (Public, No. 816). A supervisor, 5 district credit agents, 1 administrative assistant, and 4 clerks and stenographers have been appointed. Rules and regulations governing use of the funds were formulated and approved. Economic data have been gathered as to resources of 14 reservations which have come in under the act. Plans for use of the funds include provisions for making loans to corporations, which may be reloaned to individual Indians and partnerships, cooperatives and credit unions, and which may be used to finance the development and operation of corporate enterprises.

Reimbursable loans.—The appropriation for industrial loan purposes for the fiscal year 1936 was \$150,000, as compared with \$325,000 for the previous year. All but \$548 of this sum was allotted the various jurisdictions. The drastic reduction in funds curtailed industrial development on a number of reservations. In some instances available tribal funds assisted materially in carrying forward programs which otherwise would have been cut down. A total of \$187,844 was allotted to 24 jurisdictions during the year from tribal reimbursable funds. The greater proportion of loans from these two sources was of an industrial nature. According to reports which have been received, only \$12,355 was expended for subsistence loans. Thirty-six young Indian boys and girls obtained educational loans totaling \$6,137.50 from their respective tribal loan funds.

Coming demands.—The attainment of the goal of self-support by the Indians is to an important extent dependent upon a successful extension program. Sound planning, rather than haphazard use of Indian resources and credit, is essential. Results achieved by extension workers in the past have fully demonstrated that the Indians are receptive to the work. The fewness of the extension staff, however, makes it impossible for the Indians to receive the amount of help they seek and need. The growth of their livestock enterprises and the guidance which they need in order to insure sound economic use of the revolving credit fund make it urgent that a more adequate staff be provided. Funds are also sorely needed for demonstration purposes, in order that the Indians may be shown more vividly the value of improved practices and the need for husbanding their resources.

The social side of extension work should also receive more attention than it is possible to give to it at the present time. Home improvement and recreation are some of the important phases of this work which deserve attention.

RELIEF AND REHABILITATION PROGRAM

Rehabilitation.—In February 1936, the President allotted to the Office of Indian Affairs \$2,000,000 of emergency funds (later reduced to \$1,913,204 by the retransfer to the Treasury of \$86,796). According to the terms of the allotment, \$1,396,750 of the total was to be used to finance the rehabilitation of Indians through loans and grants for house and building construction; land improvement; development of water supply; and small self-help projects, such as furniture and handicraft shops, canning kitchens, and sewing projects. The sum of \$33,954 was set up as an administrative fund; and \$482,500 was earmarked for direct relief.

The allotment of the rehabilitation fund enable the Indian Office to commence an enterprise which it had long desired to undertake.

The deplorable condition of thousands of Indian homes has long called for the development of a program to build sound, livable, but minimum-cost houses, suited to the Indian's needs. In addition to these houses, it was desired to construct the outbuildings necessary as adjuncts to small farming or subsistence garden operations. Another great need was for buildings to house self-help endeavors, and for money with which to start and operate self-help projects. The whole program was to be aimed in the direction of a permanent increase of the Indian's capacity to produce and sustain himself.

This goal was continuously observed in the conduct of the program which was undertaken on the strength of the allotment of the rehabilitation fund. With it, was coupled the objective of putting to work as many Indians as possible out of the great number requiring work relief.

Allocations of the fund were made to 68 Indian jurisdictions. In conjunction with the Works Progress Administration, rules and regulations were adopted whereby superintendents had authority to certify Indians as eligible for work relief under the program. A small administrative staff was set up in Washington, and a contract was entered into with the architectural firm of Alfred Fellheimer and Steward Wagner of New York for the development of designs for houses and self-help buildings suited to the needs of the Indian.

It was originally ruled that the entire fund must be expended by June 30, 1936, but this requirement was later relaxed, allowing work on a number of the major projects to be continued after that date, with a resulting increase in the efficiency of the work performed and in the number of relief workers, as distinguished from exempt skilled workers, who could be given employment.

Particular emphasis was placed on the development of a number of communities along the subsistence-homestead plan, which commonly contemplates a fairly compact group of houses and garden tracts, with adjacent small individual farms, or farm-and-garden land cultivated communally. Thus there were developed so-called rehabilitation communities under the Sacramento Agency, in Lake County, Calif., where some 40 new homes were constructed; at the White Earth Reservation in the Consolidated Chippewa jurisdiction, where another 40 houses, together with the necessary barns and outbuildings, were constructed; at Fort Totten Agency, N. Dak., 13 houses; at Burns, Oreg., under the Umatilla Agency, 26 houses; on the Lower Brule Reservation, under Crow Creek Agency, 17 houses; on the Swinomish Reservation, under Tulalip Agency, 18 houses; on the Seger School Reserve, under Cheyenne and Arapaho Agency, 13 houses; and under the jurisdiction of the Five Civilized Tribes in Oklahoma, communities of 30 homes each near McCurtain and Wilburton were completed. A large number of other new houses were

constructed for individual families. A still larger number of Indian homes were repaired, and a large amount of work was done in the construction of buildings to house self-help enterprises.

As of June 30, 1936, a recapitulation of the work thus far performed under the rehabilitation program showed that disbursements and commitments totaled \$779,617. A total of 4,830 individuals had received 595,856 man-hours of employment. It was estimated that upon completion of the program more than 2,000,000 man-hours of employment will have been produced. A total of 604 new houses had been completed or were under construction; 561 new outbuildings had been completed or were under construction; 280 buildings to house self-help enterprises were completed or under way; and some 899 houses had been repaired. In addition to those given direct employment, an estimated total of 4,698 Indian men and 4,799 Indian women had been benefited through self-help projects, and an estimated 6,000 individuals stood to be benefited through the work of house construction and repair.

Relief from other sources.—Aside from this specific program, needy Indians continued to share in other forms of relief. A small amount of money for relief is available each year from regular Indian Service appropriations. A number of W. P. A. projects have been approved on and in the vicinity of Indian reservations. These gave not only the opportunity for Indian employment but were the means of securing such sorely needed physical improvements as buildings, fences, sidewalks, and canals. Indians participate in the distribution, through the States, of surplus commodities, in addition to receiving direct shipments of clothing from stocks surplus to the War Department and other governmental units. A number of Indians have been accepted as resettlement and rehabilitation clients. Some have received help through the National Youth Administration. No source of help is being overlooked.

Social-security program.—During 1936, a beginning was made toward the participation by Indians in the benefits of the social-security program, as conducted by those States having Indian populations. Such benefits include old-age assistance, aid to dependent children, services for crippled children, child-welfare services, and aid to the blind.

CONSTRUCTION

Construction accomplishments during the year included numerous day schools, hospitals, quarters for employees, heating and power plants, water and sewer systems, and irrigation developments. The entire program has been made possible by allotments from the Public Works Administration. Included in the larger and more important structures which have been completed and are now in use are

the Indian addition to the Ah Gwah Ching State Sanitorium, Minnesota; the Salt River Day School, Arizona; Sacaton Day School, Arizona; and the Colville Hospital, Washington. Practically all of the 47 day schools in the Navajo area were completed and placed in operation.

The Central Navajo Agency has also been brought nearly to completion. This project included the construction of an administration building, Indian council house, quarters for employees, heating and power plant, water and sewer system, and numerous other buildings. This development is built entirely of native stone and was designed by a firm of architects who have made an intensive study of the type of architecture most suitable to the Southwest area. More than 90 percent of the labor on this project has been done by Navajo Indians.

Funds have also been made available from the Public Works appropriation for the construction of several large and important hospitals. The largest of these will be a combination 150-bed tuberculosis sanatorium and a 75-bed general hospital at Talihina, Okla. Plans and specifications for these projects are being rushed to completion and it is expected that construction will be started at an early date. Contracts have been let, and construction is progressing on hospitals at Yuma, Calif.; Blackfeet and Crow Agencies, Mont.; Sisseton, Yankton, and Crow Creek Agencies, S. Dak.; and Cass Lake, Minn. Other hospitals are being erected by force account at Zuni, N. Mex.; Warm Springs, Oreg.; and on the Western Shoshone Reservation, Nev. Field studies were completed for the new Sioux sanatorium to be located at Rapid City, S. Dak., and plans for this institution, which will have more than a 100-bed capacity, are rapidly nearing completion.

In the last 12 months approximately \$8,000,000 has been expended by the Indian Service for projects financed from the appropriation for public works.

The construction personnel both in the Washington office and the field offices (located at Albuquerque, N. Mex.; Billings, Mont.; and Muskogee, Okla.) has been increased to take care of the additional work.

(See also the discussion, on p. 185, of the construction work being done under the rehabilitation program; and p. 183 for a description of construction done in connection with our regular extension work.)

COOPERATION WITH SOIL CONSERVATION SERVICE

The work of protecting the foundation of all Indian life—of checking erosion, of reducing the disastrous wastage of the soil, and of rebuilding its vegetative cover and fertility—has been continued and greatly expanded during the year, with the active cooperation

of the Soil Conservation Service of the Department of Agriculture. The results achieved by this cooperative effort have been so startling and convincing that cooperative agreements with the Soil Conservation Service were made for work on the Shoshone Reservation and the Warm Springs Reservation. A survey and planning unit was created by the Soil Conservation Service to study Indian reservations and, on the basis of these studies, to prepare plans and programs for erosion control, soil conservation, and proper land use, to be carried out by the Indian Service. Initially this survey and planning group studied conditions on the Gila River, Pima, Walapai, the Havasupai, the Uintah-Ouray, and the Jicarilla Reservations. Eight additional reservations are to be surveyed and studied by this unit during the coming year. Aerial maps covering 12 reservations were contracted for to aid the work of this Soil Conservation group.

For the Navajo Reservation soil conservation and range management plans for 19 grazing units were started by the integrated Indian Service and soil-conservation administration during the year, and plans for 2 of the grazing districts were completed. In the Pueblo jurisdiction range-management and soil-conservation plans for five pueblos were completed. Laguna and Acoma Pueblos formally agreed to the stock reduction of almost 50 percent prescribed by the range-management plans, and immediately carried out a proportion of the total stock reduction contemplated for the initial year. Both on the Navajo and the Pueblo areas convincing demonstrations showed the Indians that a limited number of ewes on good grass would supply a larger number of lambs and a greater amount of wool than could be obtained from twice the number of ewes maintained without proper management on a depleted range.

On the basis of the results already achieved, it is planned to extend the cooperative work of the Indian Service with the Soil Conservation Service to additional reservations during the fiscal year ahead.

The integrated Indian Service and Soil Conservation Service in the Pueblo and Navajo areas has supplied a new type of administrative procedure suggestive to the whole of Indian Service and to Federal service generally. Each of these jurisdictions represents the consolidation of a number of prior smaller jurisdictions. Much power from the Washington office is delegated to the superintendents and their local staffs in these two areas, and while preserving all requisite technical distinctions, Indian Service and Soil Conservation Service are functionally integrated. A more effective centering of service and of program in very local areas is made possible. A new structure of Indian administration is taking form in these two regions.

INDIAN EMERGENCY CONSERVATION WORK

Indian emergency conservation work meets a twofold need. It has provided employment and it has improved reservation lands. Through this work Indians are becoming trained for self-support on reservations which, through conservation of their resources, may some day become self-sustaining sources of an adequate livelihood.

I. E. C. W. ended its third year on June 30, 1936. Liberalized regulations which gave the Indian Service the supervision of this work on Indian reservations continued. Wholehearted cooperation has been given by the Department to all our efforts, and Director Fechner, through his sympathetic consideration and cordial cooperation, has aided materially in advancing the work.

The sum of \$9,000,000 was allotted for the fiscal year 1936—\$1,000,000 less than for 1935. The decrease somewhat handicapped the I. E. C. W. program, but effective results were achieved nevertheless.

Enrollment and employment.—It is estimated that approximately 30,000 Indian enrollees have been employed since work began in 1933. The total average daily number of men on the pay roll during the last 3 years has been 8,941 and the men have worked a total of 8,985,773 calendar days. Some of the agencies staggered employment.

Indians were given preference for employment in supervisory jobs and enrollees were taken over into them as rapidly as they could be trained. It is difficult to find Indians technically trained as foresters and engineers. However, a large number of group foremen, mechanics, machine operators, camp assistants, and assistant foremen have been Indians. In skilled, "facilitating", and supervisory positions, the average per month up to and including March 31, 1936, shows 589 Indians employed as against 479 whites.

Indian enrollees are permitted to work from camps or from their own homes. They are paid \$30 per month cash allowance, as in white C. C. C. camps, with quarters and food in camp. Where Indians live at home and subsist themselves, they are allowed commutation of \$15 per month for quarters and rations.

The family camp is encouraged. This arrangement is advantageous to the Government and beneficial to the Indians. Family camps permit regular employees of the Service to visit Indian groups frequently and to help them in sanitation and health problems, recreation, and welfare activities.

Health and accidents.—Few work-connected accidents were reported; there was some illness, and there were very few deaths. Special stress is placed upon safety. By arrangement with the Red Cross, first-aid schools were held at seven centers during the past year. Certificates were given to 194 Indians, of whom 113 qualified

as instructors, thus providing personnel for a thoroughgoing first-aid training program.

Production accomplishments.—Varied work projects were undertaken on 74 reservations in 23 States. Work has been carefully integrated with the developmental program for each reservation. Tribal authorities and the technical staff at each agency assisted the superintendent in planning. Water development was stressed. Soil-erosion work was intensified. Every consideration was given to preventing overgrazing. Check dams and other structures were built to prevent the washing away of rich soil. Water is urgently needed in all States lying between the Mississippi River and the Rocky Mountains.

A statement of the major activities undertaken during the period July 1933 to April 30, 1935, follows:

Telephone lines.....	miles.....	4, 469
Firebreaks.....	do.....	1, 614
Truck trails.....	do.....	5, 212
Horse trails.....	do.....	1, 622
Fences.....	do.....	6, 385
Springs and well development.....	units.....	3, 145
Impounding and large diversion dams.....	do.....	2, 546
Insect-pest control.....	acres.....	652, 058
Rodent control.....	do.....	4, 402, 319
Erosion control, check dams.....	units.....	61, 774
Bridges:		
Vehicle.....	do.....	543
Stock.....	do.....	179
Corrals.....	do.....	127
Elimination of useless range stock.....	head.....	246, 963

In health and morale the Indians benefited. Reservation values have increased. The work undertaken has proved the necessity of establishing long-range programs for reservation activities.

Disbursements analyzed.—Analysis of disbursements from Emergency Conservation funds for the period ending March 31, 1936, shows that pay-roll items (including shelter and subsistence, commutation thereof, and feed and hire of teams) amounted to 71.3 percent of the total funds spent. Purchases of heavy equipment totaled 7.1 percent. Supplies and materials accounted for 13.7 percent. Purchases of equipment were kept to a minimum consistent with efficient work. However, the equipment purchased definitely increased the amount of work accomplished.

Education.—This past year greater stress has been laid on education and recreation. This program, which is developing hopefully, is characteristically decentralized and flexible, resting upon local initiative. Plans have been modified according to the needs of each reservation but are unified and coordinated through office and field

supervision. Training on the job, leisure-time activities, including both athletics and adult education, and special projects, such as the first-aid instructors' training, were the three typical means employed. The nature of the training has been vocational rather than academic. In all respects, results were due in large measure to generous voluntary assistance of regular Indian Service and technical employees and from outside sources.

Opportunities for leadership.—Leadership training has been a major objective. Indian enrollees commencing at minimum pay may, by application and industry, progress through minor positions to higher brackets, such as group foreman or even project manager. The Indians have welcomed this opportunity. Many have shown dependability and real leadership. There has been a gratifying number of promotions, and several from I. E. C. W. were able to obtain employment at higher wages in the Indian Service and elsewhere.

Savings accumulated.—Indians have saved their wages and in many instances have purchased household equipment, clothing, and some livestock. Approximately \$1,500,000 has been deposited during the past 3 years as individual Indian money, and a substantial balance remains available for use by the Indians later on.

Indians at Work.—This semimonthly magazine continues to be popular not only with the Indians and Indian Service personnel but also with schools, organizations, and individual friends of the Indians. Twelve thousand copies are now being sent out each 2 weeks.

INDIAN LANDS AND MINERALS—TRIBAL CLAIMS

New Indian lands.—The purchase of lands under the Navajo-Arizona Boundary Extension Act of June 14, 1934 (48 Stat. L. 960), has been practically completed. A total of 310,146.37 acres has been bought with tribal funds, as authorized by the act, and added to the Navajo Reservation. (This figure includes pending negotiations which will be completed in the very near future.) There are, however, a few isolated white-owned tracts within the reservation which cannot yet be purchased because the vendors demand a price far above the actual worth of their property. Under acts of Congress approximately 21,500 acres of land have been added to the Fort McDermitt Reservation, Nev.; and 80 acres to the Jicarilla Reservation, N. Mex., and authority has been granted the Secretary of the Interior to set aside not to exceed 171,200 acres of land for the Indians of the Walker River Reservation, Nev. Substantial progress is being made in the purchase of lands within the various pueblos with funds awarded them pursuant to the Pueblo Lands Board Act as amended. There are 28 additional tracts that have actually been acquired at a cost of \$12,001.26, and options obtained on many more,

final action on which is delayed pending completion of probate proceedings in the local courts. Lands have been acquired for school, hospital, and other administrative sites involving 18 tracts covering approximately 222 acres. Pursuant to authority contained in section 5 of the Indian Reorganization Act of June 18, 1934 (48 Stat. L. 984), options have been obtained covering 127,681.67 acres for a total cost of \$985,474.79. Of this total, options covering 111,887.37 acres have been accepted by the Department at a cost of \$859,431.71. Title papers have been submitted covering 65,790.04 acres for a total consideration of \$607,076.

In cooperation with the Resettlement Administration, which took over those functions of the land program of the Federal Emergency Relief Administration concerning the so-called submarginal land acquisition activities, a total of 1,302,747 acres has been optioned at a total estimated cost of \$3,762,792. This difference in figures over those contained in last year's annual report is occasioned by the fact that, due to a drastic curtailment in funds for use by the Resettlement Administration, a good many of our projects necessarily were abandoned. At this writing options have been accepted by the Resettlement Administration constituting legal commitment covering 1,196,085 acres at a total cost of \$3,448,976. Purchases have actually been completed covering 573,392 acres of land at a total cost of \$1,509,172.

In furthering the land-acquisition program under the Indian Reorganization Act, a total of \$2,000,000 is available for the fiscal year 1937, one-half of which is expendable and the other half contractual. Allocations of this \$2,000,000 have been made for land purchases within the States of Nevada, California, Idaho, Washington, North Dakota, South Dakota, Montana, Utah, Oklahoma, Michigan, Minnesota, Wisconsin, Mississippi, Florida, and North Carolina.

Lands restored to Indians.—Under section 3 of the Indian Reorganization Act of June 18, 1934 (48 Stat. L. 984), approximately 211,959 acres formerly opened to homestead entry have been returned to a reservation status. Of this area, 192,577.06 acres were restored to the Flathead Reservation; 9,504.51 acres were restored to the Pine Ridge Reservation; 9,277.59 acres were restored to the Grand Portage Reservation; and 600 acres were restored to the Kiowa, Comanche, and Apache Reservations.

Lands leased for Navajos.—During the year an aggregate of 595,184 acres of white-owned lands was leased for the Navajo Indians at an annual rental of \$19,526.16. The lands are leased pending acquisition by purchase or exchange in Arizona under the provisions of the act of June 14, 1934 (48 Stat. L. 960), or the enactment of similar legislation applicable to New Mexico.

Extension of trust periods.—By order of the President, the period of trust on allotments made to Indians of the various tribes in Oklahoma was extended for 10 years. Section 3 of the act of June 15, 1935 (49 Stat. L. 378), extended until December 31, 1936, the trust periods on all Indian lands outside of Oklahoma which would otherwise have expired. The act of February 11, 1936 (Public, No. 435, 74th Cong.), reimposed the trust on certain lands patented to the Pala Band of Mission Indians in California and extended the trust period for 10 years from January 5, 1936.

Fee patents, sales, etc.—A few sales to white persons have been made of allotted lands to meet emergency situations on reservations not under the Indian Reorganization Act. No sales have been made releasing trust or restricted Indian lands for the year ending June 30, 1936. A number of sales to the United States in trust for individual Indian grantees from Indian grantors have been made to meet situations in which such transfers appeared to be mutually beneficial to the Indians in interest. Similar situations have also been met successfully by exchange of properties, as provided for in the Indian Reorganization Act.

Very few patents in fee have been granted to Indians on application, and these only after careful investigation showed that such action was wise in each particular case. A number of cases in which lands were purchased in past years for the Indians with trust funds and held under restricted deeds as taxable under Federal court rulings have been considered and the restrictions removed, especially where city or town lots were involved, so as to save for the Indian owner what could be realized out of the land before tax sales took the entire property. Unfortunately, some properties of this class have already been lost through taxation sales, but the Department has succeeded in obtaining legislation holding, in effect, that all lands heretofore purchased and held by restricted deeds are nontaxable until otherwise directed by Congress (act of June 20, 1936, Public, No. 716, 74th Cong., 2d sess.).

More than 50 cases, involving 16,000 acres or more, have been partitioned among the Indians during this year, and several more such cases are partially completed.

During the past fiscal year 15 patents in fee heretofore issued during the trust period without application by or consent of the Indian allottees have been canceled under authority of the act of February 26, 1927 (44 Stat. 1247), as amended by the act of February 21, 1931 (46 Stat. 1205). This brings the total number of such cancellations of which we have record to 455. Judgments have been rendered by various Federal courts for the recovery of taxes illegally assessed and collected on approximately 30 allotments, for which patents in fee

were issued without application and subsequently canceled by the Department. Suits have been instituted through the Department of Justice to clear title to, and recover possession of, approximately five allotments where allottees or their heirs have sought to dispose of the land without departmental approval.

Permits and business leases.—A number of small areas of allotted lands have been leased for business purposes so as to bring additional income to the Indian owners. A number of permits have been granted for a like purpose for tribal lands, with a noticeable increase in rental fees over those obtained in past years. Tribal councils and business committees of the Indians have been clothed with authority to determine for themselves, subject to departmental approval, when and what areas of tribal lands shall be used for mission and church purposes. One outstanding ruling has been obtained holding that the Indians of the Red Lake jurisdiction in Minnesota have the exclusive rights of fishing in the waters of Upper and Lower Red Lake within the exterior boundaries of the reservation. (See Solicitor's opinion of June 30, 1936, M. 28107.)

Minerals.—The year showed an increase in applications for leases on Indian lands for oil and gas mining purposes, particularly in Oklahoma and on the Blackfeet Reservation in Montana.

Kiowa sales resulted in a total bonus for the Indians of more than \$73,000. A total bonus in excess of \$532,000 was received for leases under the jurisdiction of the Five Civilized Tribes Agency, and more than 93,000 acres were leased during the year.

An exploratory permit was sold covering 19,200 acres on the ceded portion of the Wind River or Shoshone Reservation, Wyo., with provision for certain specific seismographic work. The British American Oil Co. was the successful bidder.

On March 25, 1936, the Secretary of the Interior signed an order revoking the order of September 20, 1929, and all subsequent orders which opened to exploration, location, and lease for mining purposes for minerals other than oil and gas, unallotted Indian lands on reservations to which section 26 of the act of June 30, 1919 (41 Stat. 31), as amended, was applicable. The order does not affect valid locations already made nor existing leases in good standing.

A number of good wells were drilled in the South Burbank unit in the Osage Reservation, Okla. This area was unitized and placed under a blanket lease carrying a 17½-percent flat rate royalty, and it is the belief of experts that the tribe will benefit through an increase in ultimate recovery which will result from the unit operation and development plan. The tribal council was agreeable to the royalty rate, which was later approved by the President, and to the unitization of the area.

A placer gold mining lease was sold embracing approximately 900 acres along the Big Horn River Canyon on the Crow Reservation, Mont. Considerable interest has been manifested in the canyon and a royalty as high as 30 percent has been offered for parts of the sands to be mined.

A decision of importance to the Choctaw and Chickasaw Indians was rendered by the Solicitor during the year, in which it was held that an abandoned railroad right-of-way traversing the Fitts Pool in the Choctaw and Chickasaw area, which had never been used and for which no damages had ever been paid by the railroad company, has reverted to the Choctaw and Chickasaw Nations. The field is rich at certain points where the right-of-way touches it and the tribes should realize a considerable sum from this strip in royalties and bonus.

Litigation.—Approximately 75 cases are now pending in the United States Court of Claims involving Indian tribal claims. Reports were made during the year to the Department of Justice and to the Court of Claims on 19 cases. The court rendered decisions adverse to the Indian tribes in seven cases. In the following two cases the Court of Claims rendered decisions in favor of the tribes:

Case No. L-51, *Seminole Nation v. United States*—Judgment in the sum of \$1,317,087.27.

Case No. H-219, *The Shoshone Tribe of Indians of Wyoming v. United States*—Judgment in the sum of \$793,821.49.

The United States has petitioned the Supreme Court for a writ of certiorari in the *Seminole case* and both sides are petitioning for further action in the *Shoshone case*.

Case No. E-346, relating to lands awarded to the Oregon-Washington Wagon Road Co., went to the Supreme Court of the United States on certiorari. The case was dismissed, but the Court indicated that the Indians had a good moral claim and that Congress should enact further legislation to permit effective judicial determination. The legislation has since been enacted.

Litigation involving the *Jackson Barnett case* is still being carried on in California and other parts of the United States. In Case No. 4556, equity, to determine the Barnett heirs, about 300 persons are claiming a share in this estate. The United States has intervened to protect the full-blood heirs.

Approximately 35 suits have been instituted, upon the recommendation of this Office, to protect the lands of these Indians, and some of the suits have already been brought to a successful conclusion. Sales of lands among the Five Civilized Tribes have been limited or restricted to emergency situations or where the lands were taxable and about to be lost through tax sales.

About 30 Osage suits in partition proceedings in the district court of Osage County, Okla., have been approved in the Department, as required by law. The greater part of the lands involved in these suits were assigned or set aside to Osage Indians who have the right to elect to purchase them in partition proceedings.

Twenty-three reports were prepared on various bills introduced in the second session of the Seventy-fourth Congress relating to Indian tribal and individual claims, and two involving membership rights with different tribes.

The Interior Department Appropriation Act of June 22, 1936, contains an item of \$81,540.49 for payment to individual Sioux Indians for acreages of land which they did not receive as allotments. This appropriation was authorized by the act of June 14, 1935 (49 Stat. L. 340), which also provided for attorney fees not to exceed 10 percent of the amount of each claim.

Land legislation.—The following legislation affecting Indian lands was enacted during the year:

Bill no.	Subject	Act no.	Approval date
S. J. Res. 177...	To define term of certain contracts with Indian tribes.	Pub. Res. 135...	June 26, 1936
S. J. Res. 243...	Distribution of judgment rendered by the Court of Claims in favor of the Indians of the Blackfeet Reservation, Montana.	Pub. Res. 115...	June 20, 1936
S. 1142.....	To reserve certain land in Nevada and Oregon as a grazing reserve for the Fort McDermitt Indians, Nevada.	Public, 419.....	Jan. 17, 1936
S. 1494.....	Amend Chippewa Jurisdictional Act to permit either side to amend pleadings.	Public, 585.....	May 15, 1936
S. 2148.....	Leasing of restricted lands of members of the Five Civilized Tribes, Oklahoma.	Public, 441.....	Feb. 11, 1936
S. 2877.....	Extend trust period on certain lands reserved for the Pala Band of Mission Indians, California.	Public, 435.....	Do.
S. 3227.....	Amend sec. 3 of the act extending the period of restriction on lands of the Five Civilized Tribes, Oklahoma.	Public, 470.....	Mar. 12, 1936
S. 3460.....	Ascertain persons entitled to compensation on account of Private Claim 111, parcel 1, Nambe Pueblo grant.	Private, 558.....	May 15, 1936
S. 3797.....	Amend Klamath Jurisdictional Act.	Public, 592.....	Do.
S. 4152.....	Validate certain conveyances by Kickapoo Indians prior to Feb. 17, 1933.	Private, 722.....	June 29, 1936
S. 4184.....	Amend Delaware jurisdictional bill.	Public, 639.....	June 4, 1936
S. 4298.....	Payment of claims of non-Indian claimants, Pueblo lands.	Public, 640.....	Do.
H. R. 7764.....	Relieve restricted Indians whose lands have been taxed or have been lost through failure to pay taxes.	Public, 716.....	June 20, 1936
H. R. 9997.....	Granting leave of absence to homestead settlers during 1936.	Public, 527.....	Apr. 10, 1936
H. R. 12073.....	Reserve certain land in New Mexico as an addition to the Jicarilla school reserve.	Public, 721.....	June 20, 1936
H. R. 12074.....	Authorize consolidation of Pueblos of Jemez and Pecos.	Public, 693.....	June 19, 1936

PROBATE WORK

Five Civilized Tribes matters expedited.—The personnel of this division has been increased by one associate attorney who helps in the general work of the office and specializes in Five Civilized Tribes matters. Under a revised system whereby unnecessary red tape has been eliminated, these matters now receive prompt attention. Involved therein are proposed transfers of Indian litigation to the

Federal courts. The total number submitted was 387, and of this number, no intervention was had in 240 cases. The probate attorneys were advised to appear and protect all rights of the Indian in 116, and in 31 cases the Government intervened. These cases involve a 20-day time limit, and it is imperative that, in order to cooperate fully with the United States district attorneys and the Department of Justice, these matters be concluded well within the time limit. Under present handling that result is accomplished; furthermore, this Office is told that these matters are now disposed of more quickly and efficiently than at any other time in the history of the Indian Office.

Master docket proves valuable.—The master docket was started on January 8, 1934. It now contains complete data on every case received by the probate division since that date, and has become invaluable in furnishing easily accessible and reliable information on the general conduct of the division's business. It also makes possible the preparation of an absolutely accurate report on the amount and nature of the business transacted. Included in this docket are all cases received from examiners of inheritance, from the Osage Nation and the Five Civilized Tribes.

Educational program helps to prevent litigation.—The educational program on preparation of wills, instituted about a year ago, is now bearing abundant fruit. Contests are avoided and the Indian is now, in most instances, secure in the belief that his exact wishes will be carried into effect.

Notice of decisions now served on interested parties.—The system evolved of notifying all interested parties of the final determination of an estate, and the allowance of 60 days in which to make application for a rehearing, is also bearing fruit. It prevents extended correspondence with Congressmen and Senators over unimportant matters, and makes it unnecessary for heirs to importune the Department in cases long since decided. The 60-day limit on rehearings brings all disputes to a head while they are still fresh in the minds of both the officials and the litigants, and prevents applications in later years when pertinent evidence is difficult to secure.

Applications for rehearing are filed and indexed in the original cases. Heretofore these were counted separately as new cases. As a result, the number of cases disposed of will not come to so large a number as reported in previous years.

The total number of original cases handled during the current year, including Osage, Five Tribes, and the field generally, is 2,310.

More personnel needed.—The division is undermanned, both in Washington and in the field. There is no time available for careful study of reports and conditions. The diligent and efficient examiner

of inheritance cannot report more than 250 cases each year. In some districts there are now pending more than that number, with the increase of the present year to be cared for. A remedy for this situation is being sought by the appointment of additional personnel.

The detailed work of the Washington office staff is so heavy that, with all employees working industriously, much of the routine work is sometimes far behind. It is urgently hoped that this difficulty may be overcome also and the work of the division brought strictly up to date.

FORESTRY AND GRAZING

During the year the name of the Forestry Division was changed to the Division of Forestry and Grazing, to signify more fully the functions of the division.

New grazing regulations.—On December 28, 1935, the Department approved the new general grazing regulations, and on May 18, 1936, the new general forest regulations were approved. The objectives of the general grazing regulations are:

1. The preservation through proper grazing practice of the forest, the forage, the land, and the water resources on Indian reservations, and the building up of these resources where they have deteriorated.
2. The utilization of these resources to give the Indians an opportunity to earn a living through grazing their own livestock.
3. The granting of grazing privileges on surplus range lands not needed by Indians under such safeguards as will yield the highest return consistent with undiminished future use.
4. The protection of the interests of the Indians from the encroachment of unduly aggressive and antisocial individuals.

Permit system now uniformly adopted.—The Blackfeet Indians, who have heretofore leased their lands for grazing purposes, have accepted the grazing-unit permit system, so that all reservations which have grazing privileges for sale have now adopted the permit system.

New forest regulations enforce conservation policy.—The purposes sought in the general forest regulations for the management of Indian forests are:

1. The preservation of Indian forest lands in a perpetually productive state by providing effective protection, preventing clear-cutting of large contiguous areas, and making adequate provision for new forest growth when the mature timber is removed.
2. The regulation of the cut to insure method and order in the harvesting of the tree capital, so as to make possible continuous production and a perpetual forest business.
3. The development of Indian forests by Indians, for the purpose of promoting self-sustaining Indian communities, to the end that the Indians may receive from their own property not only stumpage but also whatever labor the Indians are qualified to perform.

4. The sale of Indian timber in open competitive markets on reservations where the volume produced by the forest annually is more than the amount practicable of development by the Indians; or where fire damage, insect infestation, disease, overmaturity, or other causes require extensive and rapid harvesting of the timber to prevent loss.

5. The preservation of the forest for scenic purposes along public highways, in the vicinity of Indian or white communities, and whatever the recreational or esthetic value of the forest seems to exceed its value for the production of forest products.

6. The management of the forest in such a manner as to retain its beneficial effect in regulating run-off and minimizing erosion.

Timber cutting.—Timber cut under contract amounted to approximately 240,000,000 feet, of which 121,000,000 feet were cut on the Klamath Reservation. Several contracts were completed, and there was a substantial number of applications for the purchase of comparatively large units of Indian timber. The Menominee Indian Mills completed the salvaging of timber damaged by the cyclone of August 1934.

Further decentralization effected.—Decentralization has been accomplished to a certain extent by giving superintendents of Indian reservations authority to approve grazing permits with the concurrence of the regional forester, and to approve timber contracts with a stumpage value up to \$500 and up to \$10,000 with the concurrence of the regional forester.

Recreational planning begun.—Preliminary recreational plans have been initiated on some of the reservations.

There has been a growing appreciation of, and desire for, on the part of self-governing Indians, the conservation and wise use of their forest and grazing resources.

IRRIGATION

Construction.—All construction activities were carried out under allotments of the Public Works Administration, totaling \$3,000,000, for expenditure on a total of 24 projects. With few exceptions these funds were spent in the rehabilitation and improvement of existing projects through extension or betterment of the irrigation canal and lateral systems, provision of urgently needed drainage facilities, construction of additional storage reservoirs, and subjugation of land. Subsequently \$379,465 was impounded: Portions of the funds allocated for F. P. 263, Drainage Colorado River Reservation, Ariz.; F. P. 597, Payment of Indians' share of construction cost of the Bartlett Dam on the Verde River, Ariz. (to be constructed under supervision of the Bureau of Reclamation); and F. P. 605, Irrigation and subjugation for the benefit of the New Mexico Pueblos.

Construction of a number of community and subsistence gardens was provided for through the allocation of a total of \$146,000. Operations under these allocations are and will continue to be handled as a joint Irrigation and Emergency Conservation activity, with the Irrigation Division furnishing the plans and materials and Emergency Conservation the necessary labor. These developments, many of which are in the course of construction, will be of immeasurable value to the Indians. The majority of them are in areas where irrigation has not heretofore been practiced or where no major or formal irrigation project exists. A large number are located in the present drought area. The projects are being designed and constructed in such manner that the operation and maintenance can be handled by the Indians with little or no assistance.

Surveys and investigations.—In addition to the surveys and investigations required in connection with the subsistence gardens, actual field work relating to the proposed construction of the Pine River Dam, Colo., was undertaken with an allotment of \$50,000 from the Public Works Administration, F. P. 601, for surveys, test drilling, and final designs. Miscellaneous surveys of a minor nature were carried on in connection with the present and future construction programs.

Operation and maintenance.—The available funds for operation and maintenance of the various projects amounted to \$1,268,152, of which \$60,000 was appropriated from the general fund of the Treasury for water development, \$744,952 from the same source for irrigation, \$6,500 from tribal funds for irrigation, and \$516,700 from collections from water users under projects where such action is required by existing law and regulations. Activities under this heading were largely routine, consisting of the delivery of water and the repair or replacement of worn-out structures, etc. The limited funds available permitted only the most urgent work to be done.

Walker River suit.—The Federal District Court for the District of Nevada entered a decree in this litigation which was adverse to the interests of the Indians and the United States. The court did not follow the rule of law established in the so-called Winters decision, basing its action partly upon the ground that since the Walker River Reservation was created by Executive order it did not have the same status as the Fort Belknap Reservation which was created by treaty or agreement with the Indians.

Rocky Mountain Power Co. agreement.—After much consideration, numerous conferences, and a great deal of correspondence, agreement was reached with this company under which it is expected that the original license issued it covering the development at project no. 5, Flathead River and Lake, Mont., will be amended so as to provide for

completion of construction in the relatively near future. Tribal interests are exhaustively protected and improvements in the terms of the license are being obtained.

Private litigation at Flathead.—Due to the very unsatisfactory situation facing the project management each year arising from the illegal and excessive diversions by landowners on the Flathead Reservation having private water rights confirmed by the Secretary of the Interior, a decision was reached to institute a suit against certain of them to enjoin such diversions in the future. In the past such diversions have resulted in the loss of considerable quantities of valuable water to the landowners under the project proper.

Coolidge Dam infringement suit.—Under date of June 1, 1936, the Court of Claims in the case of *George Sidney Benckley et al. v. The United States*, dismissed the plaintiff's petition for damages arising from an alleged infringement of their patent by the Government in connection with the construction of the Coolidge Dam, San Carlos project, Arizona.

Crow litigation.—The Federal District Court for Montana continued to keep under advisement the matter of its decision in the Crow injunction suit brought to restrain certain nonproject landowners on the Crow Reservation from illegal diversions of water from the Crow Indian project sources of supply. Fortunately, the available supply was somewhat greater than in previous years so that the situation is not so acute as it has been.

ROADS

An appropriation of \$4,000,000 permitted the Indian Service to continue its road-construction program, begun under the Public Works authority of 1933. With better training of more Indians in the technique of road building, and with the gradual acquisition of sufficient equipment, a greater mileage of improved roads has been achieved. It has also been possible to maintain all reservation roads, including removal of snow, thus permitting operation of school busses during the winter months, as well as medical service to Indians living in outlying districts. The road fund has helped the Indians and the Government greatly, not only as a means of providing much-needed improved roads for school busses, medical assistance, agriculture, and many other necessary activities, but in giving employment to Indians in each community of every reservation. Especially has this fund been of the greatest benefit in assisting Indians in drought-stricken areas. The Hayden-Cartwright Act of June 16, 1933, provided for an appropriation of \$4,000,000 annually hereafter to continue this necessary activity on Indian reservations. With this in mind, surveys and plans are being made to continue road work in the future

as a part of a normal Indian Service program to provide better roads and the employment of Indians, which is a matter of considerable concern to the Government even in normal times.

The Gallup-Shiprock Highway is being maintained as well as possible with the \$20,000 appropriation made annually for this 90-mile reservation section of U. S. Highway No. 666. Due to heavy traffic and weather conditions, this very important highway is rapidly going to pieces. It should be reconstructed to a better standard, but if this cannot be done, at least \$100,000 should be provided annually for maintenance and betterment.

The Indian Service maintains cooperative and amicable relations with the Bureau of Public Roads, other Federal bureaus and agencies, and with the various highway departments and county commissioners, to the mutual benefit of each, particularly of the Indian Service, which has been the recipient of much bridge material and funds on cooperative road projects. Many letters have been received from chambers of commerce and prominent citizens complimenting the Indian Service on its road work.

During the year an improved road-cost system has been set up, and many young Indian men and women have been trained as clerks and cost-accountants in connection with this activity. Approximately 70 percent of every dollar is expended directly or indirectly for labor. The overhead on road work has been kept very low; at the same time professionally trained and experienced road engineers are employed on practically every reservation, thus assuring the best practices in modern road construction. The superintendents and their road engineers are assisted by six specially trained and experienced district road engineers.

Actual construction accomplishments during the fiscal year are shown by the following figures:

Number of miles of road constructed or reconstructed.....	1, 296. 1
Number of miles of road surfaced.....	686. 1
Number of miles of road maintained.....	5, 220. 6
Number of school roads constructed or otherwise improved.....	288
Number of bridges constructed.....	339
Number of bridges repaired.....	234
Number of culverts constructed or installed.....	2, 572
Total number of persons, whites and Indians, employed at one time..	12, 605
Total number of different individual Indians employed.....	14, 201
Total number of Indians employed in skilled positions.....	1, 278
Total number of whites employed in skilled positions.....	480
Total mileage of all improved dirt roads on reservations.....	12, 305. 9
Total mileage of surfaced roads (gravelled, oiled, etc.) on all reservations.....	3, 675. 9
Amount required for annual maintenance of roads and bridges.....	\$947, 798

PERSONNEL ADMINISTRATION

The policy of delegating as much authority as possible to jurisdiction superintendents is being continued and expanded. The practice of bringing in reservation superintendents to the Washington office for periodic visits has proved to be a wise one, and has resulted in a better all-round understanding of personnel administration.

Steps were taken during the year to establish additional local civil-service examining boards for the purpose of filling noneducational positions in all types of activities being undertaken by the Indian Service. Heretofore, local board examinations have been available only for the filling of positions in the Irrigation Division. Careful instructions have been issued to eliminate misassignments of personnel.

During the year a number of conferences were held with representatives of the Civil Service Commission in an effort to have included in examinations for filling Indian Service positions those factors which will insure that persons appointed to positions in this service will have a sympathetic and realistic attitude toward the Indian problem. Some of the recently announced examinations show marked improvement over previous ones.

Some progress has been made in the development of a method which, it is hoped, will ultimately result in the establishment of a procedure to promote the employment of qualified persons in so-called in-service training work. At the present time there is no method by which those who are particularly qualified by education, and who have a practical and understanding point of view on the Indian problem, can be selected from civil-service registers. We hope during the coming fiscal year to take further steps in solving this problem.

A definite effort has been made this year to stop the practice of transferring unsatisfactory employees from one jurisdiction to another, and all jurisdictional superintendents have been informed that as far as possible, personnel problems will have to be handled on the basis of the facts surrounding any particular case. As a result, many personnel problems that were heretofore permitted to continue by the transfer of the individual from one place to another have been solved.

Plans have been worked out and the preliminary work completed on a consolidation of all the personnel records of the Washington office. Beneficial results have already been effected by this work.

Employees.—On July 1, 1936, there were 6,112 "regular" positions in the Indian field service, carrying gross salaries in the amount of \$9,756,500. This does not include the positions set up for the Wash-

ington office (213 regular, and 123 temporary, including public works, emergency conservation, and rehabilitation workers) and for the Alaska service, which numbers approximately 300, nor any of the emergency activities. The increase over the number of positions in effect July 1, 1935, is accounted for by the fact that certain positions in our irrigation work, and positions in our roads activities, have been placed on the regular salary list. In addition, a large number of positions as Indian assistant have been set up to provide opportunities for Indian employment, and the educational force has been increased to take care of the expanded educational program.

EMPLOYMENT OF INDIANS

The total number of Indians for whom employment was obtained for the fiscal year 1936 was 8,140, or 29.6 percent less than in the previous year. Of this number, 4,439 were placed within the Indian Service: 4,299 on emergency projects, and 140 in the regular field service; and 3,701 were placed outside the Service with private employers. In the previous year 3,818 private placements were made by the Employment Division, but of this number 1,517 were placed through reference to the National Reemployment Service. Although the Employment Division this year has referred Indians to the National Reemployment Service, and doubtless many have secured jobs through this Service, no report on the number thus placed is available. Consequently, all 3,701 placements made outside the Service by the Employment Division were made directly by the staff of the Employment Division. This was an increase of 1,635, or 45.5 percent more than the number placed directly by the Employment Division last year. Of the number placed in private employment this year 1,965 were permanent, as compared to 1,508 last year, or an increase of 23.2 percent. Of the total private placements made by the Employment Division, the number of permanent placements increased from 39.4 percent last year to 59 percent this year.

The decrease in the number of "inside the Service" placements reported by the Employment Division is due to the fact that the Indians have become accustomed, through the advice and aid given them in the past few years by the personnel of the Employment Division, to apply in person for jobs without going to the employment office. The number securing "outside the Service" or private jobs has remained rather constant. Most of these jobs are permanent, which seem to indicate a more stable employment situation and a demand for qualified Indians by employers.

The demand for women and girls for household work still continues beyond the available supply, and placements have fallen off in consequence. This situation may be attributed largely to the

better opportunity for employment on the reservations. There have been more jobs for Indian women and girls at agencies, schools, and hospitals, and increased employment of Indian men has meant that fewer women have had to take jobs away from home. Also, there has been an effort on the part of the social workers connected with the Employment Division to raise the standards of domestic employment and to stabilize it; this has meant fewer placements but more continuous employment.

The Kansas City employment office was closed because most of the girls placed were from Oklahoma and wanted work nearer their homes. An Oklahoma Indian girl, who has been employed in the employment office in Phoenix, Ariz., for several years, was transferred to our office in Oklahoma City to take over the placements of Indian women and girls in Oklahoma. An attempt is, therefore, being made to bring this service to the Indians.

The Employment Division has centered its attention largely upon the placement of qualified Indians in the better type of jobs instead of upon mass-recruiting of Indians for any and every type of work. There is developing, therefore, a specialized and individualized placement procedure. This has made possible the accumulation of authentic work records on individuals who have been placed; thus, as this process continues a more efficient service will develop.

APPROPRIATIONS

For expenditure during the fiscal year 1936 the sum of \$30,019,065 was made available by Congress. Of this amount \$28,519,132 was appropriated from the Federal Treasury and \$1,499,933 from funds held in trust by the United States for various Indian tribes. The appropriation from the Treasury included \$4,000,000 for the construction and maintenance of Indian Service roads (an increase of \$2,000,000 over the allotment for the previous year), and \$981,000 for the construction of public schools for the benefit of both white and Indian children. The net increase over the appropriation for 1935 was \$9,362,068, which included \$2,500,000 for the establishment of a revolving loan fund for making loans to Indian-chartered corporations and \$1,000,000 for the acquisition of land for Indian use, in accordance with the provisions of the Indian Reorganization Act of June 18, 1934. Substantial increases were granted for health and educational work as well as for other branches of the Service.

There follows a comparative statement of Indian Service appropriations for the last 4 years and the fiscal year 1937:

TREASURY APPROPRIATIONS

Object	1932	1933	1934	1935	1936	1937
General purposes.....	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00	\$1,806,894	\$2,780,880	\$3,343,401.05
Industrial assistance.....	1,605,000.00	1,301,000.00	1,233,881.67	1,060,510	3,740,490	2,288,470.00
Irrigation and water development.....	497,601.00	457,824.00	599,614.00	450,665	1,321,652	1,930,564.00
Education.....	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565	8,795,120	9,395,375.00
Conservation of health.....	3,658,000.00	3,508,800.00	3,281,800.00	3,264,595	3,849,620	4,422,360.00
Support of Indians.....	2,216,300.00	2,156,300.00	2,141,900.00	2,141,815	2,279,350	2,425,000.00
Miscellaneous (roads, annuities, etc.).....	40,020.00	31,020.00	31,020.00	42,020	771,020	736,020.00
Subtotals.....	20,789,606.73	19,065,998.35	17,984,945.67	16,757,064	23,538,132	24,541,190.05
Construction.....	5,570,440.00	1,654,100.00	711,600.00	400,000	981,000	-----
Roads.....	670,000.00	1,420,000.00	270,000.00	2,000,000	4,000,000	3,500,000.00
Total.....	27,030,046.73	22,140,098.35	18,966,545.67	19,157,064	28,519,132	28,041,190.05

SPECIFIC APPROPRIATIONS FROM TRIBAL FUNDS MADE TO SUPPLEMENT FOREGOING TREASURY APPROPRIATIONS

General purposes.....	\$332,913.98	\$126,300.00	\$390,501.00	\$100,000	\$9,153	\$20,000.00
Industrial assistance.....	180,532.21	45,000.00	188,000.00	35,000	151,000	381,000.00
Irrigation and water development.....	49,500.00	59,000.00	46,950.00	6,720	6,500	7,000.00
Education.....	910,000.00	803,000.00	708,600.00	599,550	389,580	332,820.00
Conservation of health.....	125,000.00	125,000.00	131,550.00	121,490	162,000	80,000.00
Support of Indians.....	1,767,100.00	1,032,380.00	789,100.00	564,155	781,700	768,400.00
Miscellaneous (roads, annuities, etc.).....	50,000.00	25,000.00	25,000.00	-----	-----	105,000.00
Total.....	3,415,046.19	2,215,680.00	2,279,701.00	1,426,915	1,499,933	1,694,220.00
Grand total.....	30,445,092.92	24,355,778.35	21,246,246.67	20,583,979	30,019,065	29,735,410.05

No figures are included in the above statements for allotments from special funds for Indian emergency conservation work, public works, and other activities in the Indian Service associated with the national recovery program.

APPENDIX

INDIAN POPULATION

An Indian, as defined by the Indian Service, includes any person of Indian blood who through wardship, treaty, or inheritance has acquired certain rights. The Census Bureau defines an Indian as a person having Indian blood to such a degree as to be recognized in his community as an Indian. Furthermore, the population enumerated at the Federal agencies is not necessarily domiciled on or near the reservations. It is the population on the agency rolls and includes both reservation and nonreservation Indians. Thus an Indian may be carried on the rolls because of tribal inheritance rights, etc., and may reside anywhere in the United States or in a foreign country. Reports of births and deaths among the absentees are often not received. In many instances certification is made to the State registrars of vital statistics and thus to the Census Bureau, but not to the Indian Service. In a considerable number of cases the addresses of the nonreservation Indians are unknown. For the above reasons the statistics of Indian population as shown in the decennial reports of the Bureau of the Census do not agree with the statistics of the Indian Service.

The total estimated and enumerated number of Indians reported on January 1, 1936, by the Indian agencies was 334,013. This number consists of 238,283 Indians actually enumerated and 95,730 Indians taken from the earlier or special censuses and estimates based on records. The latter number will be considered hereafter as an estimate. (See tabular statement.)

The aggregate estimate and enumerated number of Indians reported by Federal agencies on January 1, 1936, increased by 3,152 over the corresponding figure from January 1, 1935, or 1 percent for the year.

Oklahoma has far more Indians than any other State. If the Five Civilized Tribes, Miami, and Peoria Indians are included, the Indian population is 96,244 or 28.8 percent of the aggregate Indian population. Arizona ranks second with 45,013, or 13.5 percent; followed by New Mexico with 35,570, or 10.6 percent; South Dakota with 27,401, or 8.2 percent; and California with 23,824, or 7.1 percent of the total. The other five States with over 10,000 Indian population are in the order named: Montana, Minnesota, Washington,

Wisconsin, and North Dakota. The first five States represent 68.3 percent of the entire Indian population, while the 10 States with an Indian population of over 10,000 form 88.6 percent of the aggregate Indian population.

It is significant that 87.6 percent of the 238,283 enumerated Indians resided at Federal jurisdictions, while only 29,489 or 12.4 percent resided off the reservations.

Of the enumerated population on January 1, 1936, the most important tribes numerically are the Navajo, Sioux, including the Assiniboin and Chippewa, numbering 44,078, 35,412, and 26,127, respectively; while in 1930 the same tribes were 40,863, 33,168, and 23,647. The increase from April 1, 1930, to January 1, 1936, for the Navajo Tribe being 3,215, or 7.9 percent; for the Chippewa Tribe, 2,480, or 10.5 percent; and the Sioux, including the Assiniboin, 2,244 or 6.8 percent.

As reported by the superintendents of the various agencies the full-blood Indians constituted over 60 percent of the enrolled Indian population while the mixed blood was less than 40 percent. The full-blood Indians in 11 of the States shown in table 2 formed over 50 percent of the enrolled Indian population. Six of these States had full-blood population of over 90 percent and in two other States the full-blood Indian population was over 80 percent. In 7 of the 22 States the full-blood population ranged between 40 and 50 percent. Minnesota has the smallest full-blood enrolled Indian population, and in Iowa, Mississippi, New Mexico, Arizona, and Florida practically all the enrolled population is full-blood. In none of these five States did the mixed Indian blood reach 3 percent of the total enrolled Indian population.

Arizona has more full-blood enrolled Indians than any other State, followed by New Mexico. In these two States the enrolled full-blood Indians constitute 53.9 percent of all the full-blood enrolled Indians in the United States.

The Indian population not actually enumerated (termed an estimate) is 95,730, which is as follows:

California:

Tulare County Indians, and Indians on Rancheria and public-domain allotments, on Apr. 1, 1930, Sacramento Agency-----	1, 735
Other Indians under Sacramento Agency but not enumerated on census rolls, 1930 estimate, Sacramento Agency-----	8, 761
California, Indian census May 16, 1933, not otherwise reported----	4, 483
Michigan, 1927 census-----	1, 192
New York, 1932 estimate-----	4, 523
Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930):	
Cherokee-----	40, 904
Chickasaw-----	4, 685
Choctaw-----	16, 641

Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930)—Contd.

Creek.....	8,607
Seminole.....	1,789
	<hr/> 72,626

Quapaw Agency:

Miami Reservation, 1935 estimate..... 290

Peoria Reservation, 1935 estimate..... 400

Texas, 1936 special report..... 400

Washington (Taholah Agency), unattached Indians, largely of Cowlitz
Tribe, 1936 estimate..... 500

Wisconsin:

Rice Lake Band of Chippewas, special census, July 1930..... 221

Stockbridge Reservation, Keshena Agency, 1910 census..... 599

The Indian population in the 24 States and the District of Columbia in which there were no Federal agencies in 1930 was 10,456. Doubtless many of these Indians are duplicated in the columns "Residing elsewhere" in table 2. See the 1933 Annual Report of the Secretary of the Interior, page 112, table 1.

TABLE 1.—Indian population by age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All ages.....	332,397	170,350	162,047	25 to 29 years.....	23,491	12,127	11,364
Under 5 years.....	46,680	23,447	23,233	30 to 34 years.....	19,309	10,032	9,277
Under 1 year.....	9,296	4,681	4,615	35 to 44 years.....	33,031	17,285	15,746
1 to 9 years.....	46,736	23,434	23,302	45 to 54 years.....	25,039	13,403	11,636
0 to 14 years.....	39,456	20,028	19,428	55 to 64 years.....	16,787	9,178	7,609
5 to 19 years.....	36,219	18,154	18,065	65 to 74 years.....	10,030	5,257	4,773
20 to 24 years.....	28,843	14,697	14,146	75 and over.....	6,327	3,079	3,248
				Unknown.....	449	229	220

Source: Bureau of the Census Department of Commerce.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence, Jan. 1, 1936

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arizona	238,283	121,430	116,853	203,554	104,433	99,121	5,240	2,569	2,671	29,459	14,428	15,061
Cochise River Agency, see California²	45,013	23,242	21,771	43,396	22,233	21,003	309	148	161	1,308	701	607
Cocopah Reservation (Cocopah)²	1,193	655	538	679	334	345	29	20	9	485	260	225
Cochise River Reservation	713	401	312	586	315	271	23	17	6	134	69	65
Chemehuevi	302	149	153	192	93	99	1	1	1	100	56	43
Mojave	434	248	186	383	221	172	20	16	4	21	11	10
Other tribes	7	4	3	1	1	1	2	1	1	4	2	2
Fort Mojave Reservation	416	232	184	39	38	21	6	3	3	351	191	160
Mojave	413	231	182	39	38	21	6	3	3	348	190	158
Other tribes	3	1	2							3	1	2
Fort Apache Agency and Reservation (Apache)	2,726	1,432	1,294	2,677	1,409	1,268	10	5	5	39	18	21
Hopi Agency and Reservation (Hopi)²	3,101	1,621	1,480	3,014	1,575	1,439	8	6	2	79	40	39
Navajo Agency, see New Mexico and Utah	21,844	11,235	10,609	21,810	11,220	10,590	26	13	13	8	2	6
Hopi Reservation (part of) (Navajo)	3,482	1,800	1,682	3,471	1,791	1,677	11	6	5			
Leupow Reservation	2,188	1,116	1,078	2,185	1,108	1,077	3	2	1			
Navajo	2,185	1,110	1,075	2,182	1,108	1,074	3	2	1			
Other tribes	3	3	3									
Southern Navajo Reservation, see New Mexico (Navajo)	11,861	6,146	5,715	11,840	6,143	5,706	8	3	5	4		4
Western Navajo Reservation, see Utah³	4,333	2,179	2,154	4,305	2,175	2,130	4	2	2	4	2	2
Navajo	4,280	2,121	2,159	4,276	2,157	2,119				4	2	2
Paute	33	20	13	29	18	11	4	2	2			
Painte Agency, in Utah, and Kaibab Reservation (Paute)	89	53	36	84	51	33				5	2	3
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)	413	231	182	164	91	73	46	29	17	203	111	92
Pima Agency	6,163	3,146	3,017	5,908	3,039	2,878	119	36	83	136	80	56
Fort McDowell Reservation (Mojave-Apache)	200	112	88	176	99	77	7	2	5	17	11	6
Gila River Reservation	4,718	2,397	2,321	4,585	2,337	2,248	53	14	39	80	46	34
Mariopac	496	237	259	493	236	257	2		2	1		
Pima	4,150	2,119	2,031	4,024	2,062	1,962	49	14	35	77	43	34
Other tribes	72	41	31	68	39	29	2		2	2	2	
Mariopac Reservation (Papago)	176	95	81	176	95	81						
Salt River Reservation	1,069	542	527	971	499	472	59	20	39	39	23	16
Pima	1,980	929	951	962	496	468	59	20	39	39	23	16
Other tribes	9	3	6	9	3	6						
San Carlos Agency and Reservation (Apache)	2,944	1,519	1,424	2,847	1,456	1,391	35	18	17	62	36	26
Sells Agency	5,894	3,015	2,879	5,835	2,981	2,854	27	15	12	32	19	13
Gila Bend Reservation (Papago)⁴	228	125	103	228	125	103						

Papago Reservation.											13
Papago.	5,142	2,615	2,527	5,083	2,581	2,502	27	10	12	32	19
Pima.	3,132	2,609	4	5,083	2,581	2,502	17	9	8	32	19
San Xavier Reservation (Papago).	524	275	249	524	275	249		6	3		
Tucson Canon Agency.	646	344	302	378	205	173	9			133	176
Havasupai Reservation (Havasupai).	202	114	88	200	112	88	1	1	3	1	
Hualapai Reservation (Walapai).	444	230	214	178	93	85	8	5	3	132	135
California.	8,845	4,515	4,330	7,201	3,728	3,473	46	24	22	1,598	895
Carson Agency, in Nevada, and Fort Independence and Indian Ranch Reservations, homesite tracts, and Bishop scattered bands.											
Paite.	1,560	776	784	1,472	740	732	6	4	2	82	50
Other tribes.	1,334	665	669	1,251	631	620	6	4	2	77	47
	226	111	115	221	109	112				5	3
Colorado River Agency, in Arizona and Fort Yuma Reservation (Yuma).											
Hoop Valley Agency.	822	427	395	727	375	352	11	6	5	84	38
Hoop Valley Reservation.	1,951	965	989	1,511	738	753	9	4	5	434	231
Hoop.	1,550	757	793	1,285	635	650	9	4	5	256	118
Klamath.	568	301	267	508	272	236	9	4	5	51	138
Rancheria.	982	456	526	777	363	414				205	93
Bear River (Bear River).	404	208	196	226	123	103				178	85
Blue Lake (Blue Lake).	23	13	10	19	11	8				4	2
Crescent City (Smith River).	69	36	33	44	19	25				25	17
Fel River (Miami).	48	19	29							48	19
Smith River (Smith River).	151	78	73	84	47	37				67	31
Mission Agency.	113	62	51	79	46	33		3	4	34	18
Augustine Reservation (Mission).	2,917	1,542	1,375	2,089	1,155	994	7			821	437
Cabazon Reservation (Mission).	13	7	6	12	6	6				1	1
Canulla Reservation (Mission).	27	17	10	22	12	10				5	5
Campo Reservation (Mission).	106	52	54	61	31	30				45	21
Capitan Grande Reservation (Mission).	131	67	64	113	56	57	1	1		17	7
Cuyapaipe Reservation (Mission).	168	87	81	156	86	70				12	1
Inaja Reservation (Mission).	3	1	2	1		1				2	1
Laguna Reservation (Mission).	33	16	17	30	13	17				3	3
La Jolla Reservation (Mission).	5	2	3	5	2	3					
La Posta Reservation (Mission).	226	123	103	140	82	58				86	45
Los Coyotes Reservation (Mission).	3	1	2	2	1					1	1
Manzanita Reservation (Mission).	85	50	35	69	45	24				16	11
Mesa Grande Reservation (Mission).	66	29	37	60	28	32				6	5
Mission Creek Reservation (Mission).	221	123	98	151	89	62	2	1	1	68	33
Morongo Reservation (Mission).	21	10	14	17	7	7				7	3
Pala Reservation (Mission).	297	160	137	198	118	80				99	42
Palm Springs Reservation (Mission).	208	111	97	153	86	67	1	1		54	24
Pauma Reservation (Mission).	49	25	24	48	25	23				22	10
Pechanga Reservation (Mission).	69	36	33	47	26	21				117	53
Pineon Reservation (Mission).	220	110	110	103	57	46				72	39
San Manuel Reservation (Mission).	183	100	83	111	61	50				15	7
San Manuel Reservation (Mission).	41	21	20	26	14	12					

¹ See estimated statement of other Indians not enumerated, numbering 95,730.

² Fort Yuma Agency abolished. Cocopah and Fort Yuma Reservations formerly under Fort Yuma Agency now under Colorado River Agency.

³ Hopi Indians numbering 423 transferred from Western Navajo Reservation to Hopi Reservation, hence, the marked change in population.

⁴ April 1, 1934 population.

⁵ Walker River Agency abolished and the reservations formerly under that agency transferred to Carson Agency.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Mission Agency—Continued.												
San Pascual Reservation (Mission)	9	4	5	9		5				26	17	9
Santa Rosa Reservation (Mission)	51	32	19	25	15	10				65	28	37
Santa Ynez Reservation (Mission)	84	39	45	119	107	88			1	45	20	25
Santa Ysabel Reservation (Mission)	241	127	114	135	54	54				17	9	8
Soboba Reservation (Mission)	125	63	62	136	17	19						
Sycuan Reservation (Mission)	36	17	19	36	17	19						
Torres-Martinez Reservation (Mission)	196	112	84	175	102	73			2	19	10	9
Sacramento Agency.												
Fort Bidwell Reservation	1,392	805	787	1,402	700	702			6	177	98	79
Painte	135	81	54	86	49	37			5	38	26	12
Other tribes	133	81	52	86	49	37				36	26	10
Fort Bidwell Reserve and Public Domain Allotments.	2		2							2		2
Pit River.	430	214	216	335	168	167				95	46	49
Other tribes	321	161	160	315	159	156				6	2	4
Round Valley Reservation.	109	53	56	20	9	11				89	44	45
Maidu.	189	99	90	808	395	413			1	29	18	11
Poma.	149	70	79	141	64	77			1	1	1	
Wailaki.	219	98	121	206	91	115			1	13	6	7
Wintu.	123	63	60	119	62	57				4	1	3
Yuki.	93	45	48	92	44	48				1	1	
Other tribes	66	30	27	62	36	26				4	1	
Tule River Reservation.	188	96	92	173	88	85				15	8	7
Kern River.	43	24	19	36	22	14				7	2	5
Yawilmani.	84	42	42	76	36	40				8	6	2
Other tribes.	61	30	31	61	30	31						
Colorado.												
Consolidated Ute Agency, see Utah.												
Southern Ute Reservation (Ute)	834	423	411	816	413	403			7	6	5	1
Ute Mountain Reservation (Ute)	386	199	187	372	191	181			5	6	5	1
Florida: Seminole Agency and Reservation (Seminole)												
Idaho.	448	224	224	444	222	222			2	4	3	1
Coeur d'Alene Agency, see Washington.												
Coeur d'Alene Reservation.	577	285	292	572	285	292				465	227	238
Coeur d'Alene.	4,705	2,087	2,618	3,565	1,759	1,806			74	289	135	154
Cree.	2,161	1,023	1,138	1,737	821	916			48	173	81	92
Kootenai Reservation (Kootenai).	623	298	325	436	208	228			5	173	81	92
Nez Perce Reservation (Nez Perce).	2	2	2	2	2	2						
	118	58	60	104	52	52				14	6	8
	1,420	667	753	1,217	561	656			43	102	48	54

Fort Hall Agency and Reservation, see Utah.	1,847	957	890	1,829	840	789	44	26	18	174	91	83
Bannock.....	346	172	170	277	137	174	12	6	6	31	6	31
Shoshone.....	1,497	783	714	1,348	703	645	32	20	12	117	60	57
Other tribes.....	4	4	4	4	4	4						
Western Shoshone Agency and Reservation, in Nevada.												
Paiute.....	197	107	90	179	98	107	16	8	8	2	1	1
Shoshone.....	124	70	54	108	63	45	15	7	8	1		
Paiute.....	73	37	36	71	35	36	1	1				
Iowa: Sac and Fox Sanatorium Jurisdiction and Reserva- tion (Sac and Fox of the Mississippi)												
Kansas.												
Potawatomi Agency.												
Iowa Reservation (Iowa).....	433	215	218	388	195	193	29	10	19	16	10	6
Kickapoo Reservation (Kickapoo).....	1,942	1,000	942	1,344	813	731	197	96	101	201	91	110
Potawatomi Reservation (Potawatomi).....	1,942	1,000	942	1,344	813	731	197	96	101	201	91	110
Sac and Fox Reservation (Sac and Fox of the Missouri).....	508	272	236	480	259	221	3	1	2	25	12	13
Sawyer Reservation (Sawyer).....	321	163	158	265	140	125	23	13	10	33	10	26
Potawatomi Reservation (Potawatomi).....	988	508	480	710	373	337	150	73	77	128	62	66
Minnesota.												
Consolidated Chippewa Agency.	15,544	7,826	7,718	11,169	5,773	5,396	432	207	225	3,943	1,846	2,097
Cass Lake and Winnibogish Reservations (Chippewa).....	12,936	6,485	6,451	9,121	4,709	4,412	400	195	205	3,415	1,581	1,834
Grand du Lac Reservation (Chippewa).....	652	310	342	440	214	226	2	1	1	210	95	115
Fond du Lac Reservation (Chippewa).....	529	274	255	474	253	221	14	8	6	41	13	28
Grand Portage Reservation (Chippewa).....	1,302	684	618	727	390	337	12	5	7	563	289	274
Leech Lake Reservation (Chippewa).....	372	160	212	275	128	147				97	32	65
White Earth Reservation (Chippewa).....	8,225	4,092	4,450	814	420	394	51	23	28	57	29	28
White Oak Point Reservation (Chippewa).....	8,225	4,092	4,450	814	420	394	51	23	28	57	29	28
Purchase Lands (Chippewa).....	576	309	267	507	275	232	2	1	1	67	33	34
Purchase Lands (Chippewa).....	358	184	174	321	166	155				37	18	13
Pinestone School Jurisdiction and Purchased Lands (Sioux).	557	281	276	152	78	74	1		1	404	203	201
Red Lake Agency and Reservation (Chippewa).	2,651	1,060	991	1,896	986	910	31	12	19	124	62	62
Mississippi: Choctaw Agency and Purchased Lands (Choctaw).												
Montana.												
Blackfeet Agency and Reservation.												
Blackfeet.....	1,841	934	907	1,833	929	904	8	5	3	1,748	865	943
Other tribes.....	15,752	8,021	7,731	13,551	6,974	6,577	453	242	211	1,520	246	274
Crow Agency and Reservation (Crow).	4,418	2,107	2,011	3,560	1,842	1,718	98	19	19	500	245	264
Flathead Agency and Reservation (Flathead).	4,102	2,104	1,998	3,555	1,480	1,715	38	19	19	500	245	264
Fort Belknap Agency and Reservation.												
Assimboin.....	16	3	13	2	2	3				11	1	10
Gros Ventre.....	2,127	1,074	1,053	1,895	968	927	28	8	20	204	98	106
Other tribes.....	3,651	1,545	1,503	2,376	1,139	1,111	64	25	8	564	247	317
Fort Peck Agency and Reservation (Flathead).	1,434	741	693	1,302	671	631	33	25	8	99	45	54
Assimboin.....	672	346	326	623	318	305	14	10	4	35	18	17
Gros Ventre.....	758	393	365	675	351	324	19	15	4	64	27	37
Fort Peck Agency and Reservation.												
Other tribes.....	4	2	2	4	2	2						
Fort Peck Agency and Reservation.	2,747	1,375	1,372	2,338	1,156	1,152	189	66	73	270	123	147
Assimboin.....	1,514	770	744	1,285	666	619	70	35	35	159	69	90
Sioux.....	1,233	605	628	1,053	520	533	32	32	38	110	53	57
Rocky Boy's Agency and Reservation.	713	376	337	598	313	285	47	29	18	68	34	34
Chippewa.....	478	246	232	386	197	189	38	21	17	54	28	26
Cree.....	189	96	93	175	87	88	8	7	1	6	2	4
Other tribes.....	46	37	34	29	8	8	1	1				
Tongue River Agency and Reservation.	1,562	800	762	1,482	757	725	57	31	26	23	12	11
Cheyenne.....	1,559	797	762	1,479	754	725	57	31	26	23	12	11
Other tribes.....	3	3	3	3	3	3						

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nebraska												
Winnebago Agency	4,563	2,370	2,193	3,221	1,664	1,557	342	175	167	1,000	531	469
Omaha Reservation (Omaha)	4,563	2,370	2,193	3,221	1,664	1,557	342	175	167	1,000	531	469
Poncha Reservation (Poncha)	1,677	883	794	1,400	733	667	34	19	15	243	131	112
Santee Reservation (Sioux)	1,392	667	725	1,195	597	598	11	4	7	186	88	98
Winnebago Reservation (Winnebago)	1,280	667	613	733	375	358	214	107	107	333	185	148
	1,210	631	579	863	439	424	83	45	38	238	127	111
Nevada												
Carson School Jurisdiction, see California	5,109	2,549	2,560	4,903	2,434	2,469	182	83	99	24	12	12
Fallon Reservation	4,334	2,177	2,207	4,272	2,129	2,143	107	44	63	5	4	1
Paiute	420	213	207	406	205	200	12	6	6	2	1	1
Paiute	416	212	204	402	205	197	12	6	6	2	1	1
Shoshone	4	1	3	4	1	3						
Fort McDermitt Reservation (Paiute)	272	125	147	252	120	132	20	5	15			
Mason and Smith Valleys (Scattered Indians)	432	221	211	414	213	201	18	8	10			
Paiute	433	215	208	405	207	198	18	8	10			
Other tribes	9	6	3	9	6	3						
Nye County Scattered Indians	361	183	178	361	183	178						
Paiute	29	16	13	29	16	13						
Shoshone	332	167	165	332	167	165						
Pyramid Lake Reservation	564	279	285	564	279	285						
Paiute	561	285	276	561	285	276						
Other tribes	3	3	3	3	3	3						
Summit Lake Reservation (Paiute)	61	33	28	61	33	28						
Walker River Reservation	494	249	245	481	243	238	13	6	7			
Paiute	448	225	223	435	219	216	13	6	7			
Shoshone	46	24	22	46	24	22						
Public Domain	1,780	868	912	1,733	846	887	44	19	25	3	3	
Miami	1	1	1	1	1	1						
Paiute	274	120	154	271	118	153	2	1	2	1	1	
Shoshone	927	444	483	925	444	481	2					
Washo	578	304	274	536	284	252	40	18	22			
Paiute Agency, in Utah	190	91	99	178	86	92						
Mojave River Reservation (Paiute)	154	76	78	145	72	73						
Las Vegas Tract (Paiute)	36	15	21	33	14	19						
Western Shoshone Agency and Reservation, see Idaho	535	281	254	453	239	214						
Shoshone	440	226	214	370	191	179	68	34	34			
Other tribes	95	55	40	83	48	35						
New Mexico												
Jicarilla Agency and Reservation (Apache)	35,570	18,393	17,177	34,988	18,074	16,914	101	47	54	481	272	209
Mescalero Agency and Reservation (Apache)	703	358	345	694	351	343	7	3	1	2	1	2
	751	364	387	737	353	384	4	3	1	10	8	

Navajo Agency, in Arizona									
Eastern Navajo Reservation (Navajo)	21,967	10,569	11,152	10,808	5	5	2	1	1
Northern Navajo Reservation (Navajo)	8,456	8,456	4,228	4,228	3	3			
Southern Navajo Reservation (Navajo)	8,560	8,557	4,105	4,105	2	2			
Southern Navajo Reservation, in Arizona (Navajo)	4,951	2,479	2,469	2,479	2	2			
United Pueblos Agency ⁶	12,149	5,636	6,218	5,379	85	33	52	262	205
Santa Fe School Division ⁶	2,296	1,130	2,188	1,116	46	18	28	32	30
Nambe Pueblo (Pueblo)	127	68	119	55	4	2	4	2	2
Picuris Pueblo (Pueblo)	118	59	114	55	4	2	4	2	2
Pojoaque Pueblo (Pueblo)	8	2	6	4					
San Idelonso Pueblo (Pueblo)	132	71	66	52	9	2	7	3	2
San Juan Pueblo (Pueblo)	586	291	553	279	11	6	5	22	12
Santa Clara Pueblo (Pueblo)	426	219	203	198	13	6	7	12	10
Taos Pueblo (Pueblo)	772	379	750	388	9	2	7	13	10
Tesque Pueblo (Pueblo)	127	66	127	66					
Southern Pueblos Division ⁶	7,753	4,178	7,341	3,958	28	6	22	384	170
Acoma Pueblo (Pueblo)	1,181	613	1,123	580	543			33	25
Cochiti Pueblo (Pueblo)	309	167	142	165	140			4	2
Isleta Pueblo (Pueblo)	1,140	620	1,114	601	513			26	19
Jemez Pueblo (Pueblo)	673	361	665	356	309			8	5
Laguna Pueblo (Pueblo)	2,332	1,216	2,043	1,072	971	27	6	262	138
Sandia Pueblo (Pueblo)	125	66	115	60	55			10	4
San Felipe Pueblo (Pueblo)	623	343	616	339	277	1	1	6	2
Santa Ana Pueblo (Pueblo)	243	145	99	145	99				
Santo Domingo Pueblo (Pueblo)	923	537	916	532	384				
Sia Pueblo (Pueblo)	203	110	93	108	92			3	1
Zuni Pueblo ⁶	2,100	1,169	931	1,134	924	11	9	21	16
Other tribes	2,092	1,169	923	1,144	918	10	9	1	4
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	3,297	1,560	2,320	1,236	2	2		975	476
North Dakota	10,739	5,296	7,015	3,578	168	87		3,556	1,778
Fort Berthold Agency and Reservation	1,647	812	1,581	776	805	13	9	53	27
Arikara	599	289	310	274	292	4	1	29	14
Gros Ventre	711	349	690	338	352	4	3	17	9
Mandan	337	174	325	164	161	5	5	7	2
Fort Totten Agency and Devils Lake Reservation (Sioux)	1,005	511	494	472	451	42	21	40	18
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	45	28	45	28	17				
Standing Rock Agency and Reservation, see South Dakota (Sioux)	1,705	852	853	779	772	53	26	101	54
Turtle Mountain Agency and Reservation (Chippewa)	6,337	3,240	2,915	1,523	60	31	29	3,362	1,676
Oklahoma	22,928	11,534	17,057	8,632	8,455	718	358	5,453	2,609
Cheyenne and Arapaho Agency and Reservation (Cheyenne-Arapaho)	2,818	1,468	2,496	1,287	1,299	133	71	189	110
Kiowa Agency	6,185	3,185	6,049	2,931	3,118	29	19	109	52
Kiowa Reservation	4,721	2,294	4,683	2,266	2,367	13	6	45	23
Apache	324	169	322	167	155	1	1	1	

⁵ Walker River Agency abolished and the reservations formerly under that agency transferred to Carson Agency.

⁶ Formerly Santa Fe School, Southern Pueblos and Zuni were separate agencies, now all combined under the jurisdiction of the United Pueblos Agency.

⁷ January 1, 1935 population.

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Kiowa Agency—Continued.												
Kiowa Reservation—Continued.												
Comanche	2,181	1,065	1,116	2,154	1,054	1,100	3		3	24	11	13
Wichita Reservation	2,216	1,060	1,156	2,187	1,045	1,142	9		9	4	20	10
Caddo	1,466	708	758	1,386	665	721	16	13	3	64	30	34
Delaware	947	466	481	884	433	451	10	8	2	53	25	28
Wichita	143	67	76	143	67	76						
Wichita	376	175	201	359	165	194	6		1	11	5	6
Osage Agency and Reservation (Osage).												
Pawnee Agency	3,579	1,826	1,753	1,950	1,042	938	10	6	4	1,559	778	811
Kaw Reservation (Kaw)	3,060	1,554	1,506	2,433	1,251	1,182	195	97	98	432	206	226
Oakland Reservation (Tonkawa)	49	267	247	297	157	140	44	21	23	173	89	84
Otoe Reservation (Otoe)	742	385	357	570	297	273	17	4	3	7	3	4
Pawnee Reservation (Pawnee)	937	467	470	761	393	368	68	34	34	104	54	50
Ponca Reservation (Ponca)	818	408	410	767	383	384	36	21	15	133	56	77
Quapaw Agency	2,693	1,328	1,365	1,428	726	702	263	126	137	1,002	476	526
Eastern Shawnee Reservation (Shawnee)	269	145	124	168	82	86	27	15	12	74	27	47
Ottawa Reservation (Ottawa)	400	211	189	220	114	106	20	11	9	160	86	74
Quapaw Reservation (Quapaw)	527	253	274	330	161	169	16	9	7	181	83	98
Seneca Reservation (Seneca)	719	358	361	398	198	200	134	63	71	187	97	90
Wyandotte Reservation (Wyandotte)	778	382	396	312	171	141	66	28	38	400	183	217
Shawnee Agency	4,591	2,356	2,235	2,671	1,395	1,276	88	39	49	1,832	922	910
Iowa Reservation (Iowa)	111	52	59	110	52	58						
Kickapoo Reservation (Kickapoo)	264	142	122	256	137	119				1	8	3
Potawatomi Reservation (Potawatomi)	2,720	1,385	1,335	965	495	470	59	26	33	1,696	864	832
Sac and Fox Reservation (Sac and Fox)	863	442	421	743	396	347	14	7	9	106	41	65
Shawnee Reservation (Shawnee)	633	335	298	597	315	282	15	8	7	21	12	9
Oregon	4,695	2,300	2,395	3,557	1,759	1,768	307	169	147	831	351	480
Klamath Agency and Reservation	1,387	678	709	1,076	544	532	51	28	23	260	106	154
Klamath	808	392	416	644	329	315	7	4	3	157	59	98
Modoc	319	155	164	236	113	123	27	14	13	56	28	28
Parute	145	72	73	115	57	58	17	10	7	13	5	8
Pit River	108	55	53	81	45	36				27	10	17
Shasta	7	4	3							7	4	4
Salem School Jurisdiction	1,152	600	552	869	466	403	47	30	17	236	104	132
Grande Ronde Reservation	355	190	165	217	125	92	29	18	11	109	47	17
Clackamas	83	39	44	47	24	23	10	6	4	26	9	17
Rogue River	56	33	23	35	20	15	7	5	2	14	8	16
Umpqua	62	28	34	37	18	19				25	10	15
Other tribes	154	90	64	98	63	35	12	7	5	44	20	24

State or Territory	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020
Sioux Reservation	468	238	230	308	163	110	10	9	10	10	10	10	10	10
Chastacosta	30	12	18	25	11	11	11	11	11	11	11	11	11	11
Galice Creek	43	23	20	38	19	19	19	19	19	19	19	19	19	19
Joshua	45	24	21	15	9	9	9	9	9	9	9	9	9	9
Klamath	56	34	22	43	27	27	27	27	27	27	27	27	27	27
Meguenodon	52	26	26	39	18	18	18	18	18	18	18	18	18	18
Rogue River	49	28	21	42	23	23	23	23	23	23	23	23	23	23
Tutuni	42	16	26	39	18	18	18	18	18	18	18	18	18	18
Other tribes	151	75	76	117	61	61	61	61	61	61	61	61	61	61
Fourth Section Allottees (Public Domain)	329	172	157	294	158	136	8	7	7	7	7	7	7	7
Cherokee	18	12	6	18	12	12	6	6	6	6	6	6	6	6
Klamath	55	26	29	43	23	23	30	3	3	9	2	2	2	2
Kus	55	25	30	53	23	23	30	1	1	1	1	1	1	1
Rogue River	71	38	33	68	38	38	30	3	3	3	3	3	3	3
Tutuni	18	7	11	8	4	4	4	3	3	10	7	7	7	7
Umpqua	43	25	18	37	21	21	16	3	3	10	7	7	7	7
Other tribes	69	39	30	67	39	39	28	1	1	1	1	1	1	1
Umatilla Agency and Reservation	1,151	534	617	738	359	379	131	61	70	282	114	168	168	168
Cayuse	374	168	206	310	145	165	46	19	27	18	4	14	14	14
Umatilla	126	47	79	99	39	60	13	5	8	14	3	11	3	11
Walla Walla	633	313	320	314	169	145	69	37	32	250	107	143	107	143
Other tribes	18	6	12	15	6	6	9	3	3	3	3	3	3	3
Warm Springs Agency and Reservation	1,005	488	517	874	420	454	78	41	37	53	27	26	27	26
Palute	224	120	104	178	92	86	40	23	17	6	5	1	5	1
Tenino (Warm Springs)	483	217	266	452	204	248	15	8	7	16	5	11	5	11
Wasco	221	115	106	184	96	88	11	5	6	26	14	12	14	12
Other tribes	77	36	41	60	28	32	12	5	7	5	3	2	3	2
South Dakota	27,401	14,019	13,382	23,705	12,225	11,480	1,067	503	504	2,629	1,291	1,338	1,338	1,338
Cheyenne River Agency and Reservation (Sioux)	3,421	1,782	1,639	2,795	1,471	1,324	308	161	147	318	150	168	168	168
Crow Creek Agency	1,791	791	781	1,276	649	627	130	45	85	166	97	69	69	69
Crow Creek Reservation (Sioux)	965	473	492	829	408	421	53	15	38	83	50	33	33	33
Lower Brule Reservation (Sioux)	607	318	289	447	241	206	77	30	47	83	47	36	36	36
Flandreau School Jurisdiction and Purchased Lands (Sioux)	193	161	161	170	99	71	41	22	19	143	72	71	71	71
Pine Ridge Agency and Reservation (Sioux)	8,579	4,369	4,210	8,037	4,123	3,914	97	43	54	445	203	242	242	242
Rosebud Agency	8,609	4,403	4,206	7,712	3,974	3,738	233	115	138	330	314	330	330	330
Rosebud Reservation (Sioux)	6,571	3,382	3,189	6,233	3,203	3,030	81	39	42	257	110	117	117	117
Yankton Reservation (Sioux)	2,038	1,021	1,017	1,479	771	708	172	76	96	387	174	213	213	213
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)	2,794	1,413	1,321	1,898	1,005	893	139	67	72	697	341	356	356	356
Standing Rock Agency and Reservation, in North Dakota (Sioux)	2,132	1,068	1,064	1,817	904	913	99	50	49	216	114	102	102	102
Utah	2,120	1,094	1,026	2,000	1,034	966	54	33	21	66	27	39	39	39
Consolidated Ute Agency, in Colorado, and Public Domain Allotments (Ute)	43	25	18	43	25	18	21	12	9	4	4	4	4	4
Fort Hall Agency, in Idaho, and Washakie Sub-agency (Shoshone)	135	63	72	110	51	59	21	12	9	4	4	4	4	4
Navajo Agency, in Arizona, and Western Navajo Reservation	307	161	146	307	161	146	145	158	158	158	158	158	158	158
Navajo	303	158	145	303	158	145	145	145	145	145	145	145	145	145
Paute	4	3	1	4	3	1	1	1	1	1	1	1	1	1

TABLE 2.—Indian population in continental United States enumerated at Federal agencies, according to tribe, sex, and residence,
Jan. 1, 1936—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Utah —Continued.												
Paiute Agency, see Arizona and Nevada.												
Goshute Reservation (Goshute)	354	192	162	354	176	178	3	1	2	27	15	12
Kanosh Reservation	151	76	75	136	66	70	2	1	1	13	9	4
Paiute	23	9	14	21	7	14				2	2	
Paiute	1	1	1	1	1	1						
Paiute	22	9	13	20	7	13				2	2	
Kosharene Reservation (Ute)	28	13	15	27	13	14						1
Paiute Reservation (Paiute)	19	12	7	13	9	4				6	3	3
Shivwits Reservation (Paiute)	90	44	46	86	44	42				4		4
Skull Valley Reservation (Goshute)	39	19	20	37	18	19	1		1	1		
Gandy (Homestead) (Paiute)	5	3	2	5	3	2						
Cedar City (church property) (Paiute)	29	16	13	29	16	13						
Utah and Ouray Agency and Reservation (Ute)	1,251	653	598	1,186	621	565	30	20	10	35	12	23
Washington.	13,007	6,456	6,551	9,266	4,653	4,613	189	78	111	3,552	1,755	1,827
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation (Kalispel)	86	46	40	84	46	38	2		2			
Colville Agency	3,984	1,998	1,986	3,220	1,600	1,620	107	46	61	657	290	367
Colville Reservation (Colville)	3,154	1,596	1,558	2,608	1,346	1,262	69	32	37	477	218	259
Spokane Reservation (Spokane)	830	400	430	612	314	298	38	14	24	180	72	108
Taholah Agency	2,509	1,272	1,237	1,491	779	712	23	12	11	995	481	514
Chehalis Reservation (Chehalis)	28	21	7	19	16	3				9	5	4
Makah Reservation (Makah)	412	223	189	349	194	155	3		3	60	29	31
Nisqually Reservation (Nisqually)	64	38	26	54	34	20				10	4	6
Ozette Reservation (Makah)	2	2		2								
Quinalt Reservation	1,758	867	891	869	429	440	14	9	5	875	429	446
Chehalis	105	49	56	59	21	38				46	18	28
Quileute	255	141	114	268	130	138	1	1	6	16	10	6
Quinalt	1,219	613	606	525	267	258	12	7	5	682	339	343
Upper Chinook	123	51	72	6	5	1	1	1		116	45	71
Other tribes	26	13	13	11	6	5				15	7	8
Skokomish Reservation	211	104	107	176	92	84	5	2	3	30	10	20
Clallam	1	1										
Skokomish	210	103	107	176	92	84	4	1	3	30	10	20
Squaxin Island Reservation (Squaxin)	34	17	17	22	12	10				11	4	7
Tulalip Agency	3,507	1,763	1,744	2,080	1,039	1,041	12	3	9	1,415	721	694
Lummi Reservation	664	324	340	277	267	266				120	63	57
Lummi	663	340	323	543	277	266				120	63	57
Snohomish	197	89	108	188	85	103	3	1	2	6	3	3
Muckleshoot Reservation (Muckleshoot)	1	1		1			3		3	13	5	8
Port Madison Reservation (Suquamish)	170	84	86	154	79	75						

	2,150	1,108	1,072	2,078	1,067	1,011	19	5	14	83	36	47
Keshena Agency and Menominee Reservation (Menominee)												
Tomah School Jurisdiction												
Oneida Reservation (Oneida)	4,676	2,344	2,332	3,325	1,800	1,725	295	126	169	856	418	438
Public Domain Allotments (Winnebago)	3,235	1,631	1,604	2,303	1,193	1,110	163	68	95	769	370	399
Wyoming	1,411	713	728	1,222	607	615	132	58	74	87	48	39
Shoshone Agency and Wind River or Shoshone Reservation	2,261	1,138	1,123	2,033	1,035	998	61	30	31	167	73	94
Arapaho	2,261	1,138	1,123	2,033	1,035	998	61	30	31	167	73	94
Shoshone	1,128	566	567	1,088	553	535	16	9	14	10	10	80
	1,133			945	482	463	45	21	24	143	63	

⁸ Exclusive of Stockbridge Reservation, Keshena Agency, and Rice Lake Band of Chippewas, Great Lakes Agency (see estimated statement).

⁹ The name of the Lac du Flambeau Agency has been changed to the Great Lakes Agency.

TABLE 3.—Indian school population and school enrollment during fiscal year ended June 30, 1936

State and jurisdiction	Indian children, 6 to 18	Enrollment								Definite information not available	Not enrolled in any school	Not eligible for enrollment	Under 6 years and over 18 years in all schools	
		Total number	Public	Federal day	Federal reservation boarding	Federal nonreservation boarding	Mission private and State day	Mission private and State boarding	Sanatorium					Special schools
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Total	103,641	82,531	50,328	10,609	8,509	4,192	1,455	6,543	448	447	9,654	13,855	1,460	2,696
Arizona	13,302	8,107	655	2,985	2,012	752	257	1,189	99	128	735	4,804	98	344
Colorado River:														
Chenuehueli	38	40	18		22									2
Mohave	196	200	121	22	12	37		8			5	2	1	11
Fort Apache	771	5	228	381	7	26	52	56	3	20	44		15	2
Hopi: Hopi	661	659	27	506	4	95		24			36		11	34
Kabab (under Paiute)	29	31	1	26										
Navajo:														2
Leupp	385	430	14	23	336	46		3	8					45
Navajo (formerly under Hopi)	199	217			161	56								18
Southern Navajo	4,422	1,792	231	315	418	382		446				2,735		105
Western Navajo	1,737	439	27	44	344	41			3			1,812		34
Phoenix: Camp Verde	119	95	73	8		13				1		14	3	4
Pima	2,125	1,421	38	870	169		94	169	80	1	334	433		63
San Carlos	810	586	16	300	52	33	141	40	4		15	225	65	16
Sells	1,601	1,234	84	602				443		105	367			
Truxton Canon:														
Havasupai	48	46		23	15	8						2	2	
Hualapai	119	126		26	83	15			1	1		1	1	8
California	4,766	4,465	3,696	12	46	523	114	53	12	9	128	294	141	121
Bishop (under Carson)	449	327	271		43			1			77	45	28	
Fort Yuma	189	196	28		3	50	114		1			11	8	
Hoopa Valley	1,186	1,122	1,001			120		1		4	3	99	63	38
Mission	756	708	570			87		47			67	67	6	19
Sacramento	2,186	2,112	1,826			266		4	11		48	72	36	46
Colorado: Consolidated Ute	295	215	55	59	83	15				3		90	15	10
Florida: Seminole	182	23		23								165	35	6
Idaho	1,056	990	691	67		67		101	52	12	46	86		66
Coeur d'Alene:														
Coeur d'Alene	185	159	84			3		70	2		25	2		1
Nez Perce	349	333	236			12		31	49	5	5	27	14	16
Fort Hall	522	498	371	67		52			1		16	57	21	49
Iowa: Sac and Fox	128	129	8	102	5			1	2	13			7	8
Kansas	734	621	549			69			2		75	57	10	19
Sac and Fox	35	31	28			3			1		5		2	2
Potawatomi	299	280	234			45			1		11	15	5	5

Iowa.....	262	178	172	6	1	1	56	34	3	6
Kickapoo.....	138	132	115	15	363	47	3	7	2	4
Minnesota.....	4,749	4,307	3,245	298	249	41	308	131	14	57
Consolidated Chippewa.....	4,090	3,723	2,970	374	14	1	312	101	11	46
Pipestone.....	67	67	52	14	114	5	56			
Red Lake.....	592	517	223	105						
Mississippi: Choctaw.....	545	371	223	2	198	191	282	208	12	34
Montana.....	4,932	4,584	3,435	81	94	5	94	364	134	110
Blackfeet.....	1,203	1,138	922	5	24		59	65	25	24
Crow.....	664	632	563	21	37	155	9	56	39	25
Flathead.....	999	889	662	16	41	1		123	39	25
Fort Belknap.....	439	379	305	19				58	16	7
Fort Peck.....	832	830	742	52	13	23	12	31	26	36
Rocky Boys.....	353	339	116	4	73	3	7		1	6
Tongue River.....	442	357	125	76	165	17	66	31	20	12
Nebraska.....	1,437	1,415	1,190	41			19	3		
Winnebago.....	385	385	322	8	47	8				
Omaha.....	526	521	450	24	40	7	2	3		
Santee.....	396	379	317	2	57	1	17			
Ponca.....	130	130	101	7	21	1				
Nebraska.....	1,444	1,216	687	12	1	12	6	124	31	73
Carson (includes Walker River).....	1,209	1,013	548	216			6	137	18	63
Mojave River (under Paiute, Utah).....	39	20	16	246			19	19	3	
Western Shoshone.....	180	183	123	32	1	12	2	21	10	10
New Mexico.....	9,493	5,144	132	839	360	500	7	4,554	73	216
Jicarilla.....	172	165	9	15	90	51	3		9	7
Mescalero.....	235	225	4	31	1			28	7	18
Navajo.....	2,975	888	50	571				2,108		21
Eastern Navajo.....	3,172	1,118		620				2,086		32
United Pueblos:										
Santa Fe.....	631	645	8	427	63			40	51	54
Southern Pueblos.....	1,767	1,598	54	889	116	106	10	232	49	73
Zuni.....	543	505	7	227	243		7		6	11
North Carolina: Cherokee.....	1,068	698	8	529				357	9	26
North Dakota.....	4,303	3,526	1,663	861	154	83	5	773	147	165
Fort Berthold.....	463	439	224	123			13		17	24
Fort Totten.....	230	219	46	79	1	62	5	27	25	29
Standing Rock.....	1,257	955	633	131	60	44	40	40	46	36
Turtle Mountain.....	2,353	1,913	700	563	22	312	3	258	39	76
Oklahoma.....	38,396	31,698	26,817	476	1,353	7	6,837	593	186	722
Cherokee and Arapaho.....	703	643	345	12	208	59	46	165	40	61
Kiowa.....	2,131	1,707	1,142	396	17	97	357	201	134	134
Osage.....	1,944	1,687	1,502					65	51	68
Pawnee:										
Kaw.....	173	117	109	7				6	1	6
Pawnee.....	276	247	185	43				47	8	27
Ponca.....	266	245	137	69	2			22	6	22
Ojibwa.....	243	188	131	44				51	14	10
Tonkawa.....	18	10	8	1				4	1	

1935 data.

Washington.	3,508	3,240	2,908	20	90	1	160	61	70	268	127	7
Colville.....	907	830	724	---	19	---	78	9	39	40	6	2
Spokane.....	247	225	217	---	---	---	11	---	---	22	8	---
Taholah.....	538	475	430	---	---	1	---	---	20	58	33	15
Tulalip.....	1,049	899	872	20	11	---	---	---	11	139	75	---
Yakima.....	1,767	811	655	---	60	---	56	30	---	9	5	33
Wisconsin.	3,178	2,802	1,341	318	114	338	293	8	22	175	91	134
Keshena I.....	593	608	64	160	348	9	16	3	6	13	5	34
Great Lakes:												
Lac du Flambeau.....	250	267	58	153	14	20	---	---	9	13	4	39
Red Cliff.....	191	174	54	---	16	98	6	---	8	9	---	---
Grandon.....	87	76	62	---	10	---	4	---	---	17	45	6
Bad River.....	323	304	110	---	18	140	36	---	26	6	---	13
Lac Courte Oreilles.....	396	384	226	---	42	71	35	---	10	16	3	14
St. Croix.....	100	60	54	---	4	---	2	---	40	---	---	---
Tomah.....												
Onetda.....	820	557	436	5	20	---	91	5	200	66	18	3
Winnebago.....	418	372	267	---	2	---	103	---	26	35	16	15
Wyoming.	695	645	169	187	24	---	265	---	---	66	16	16
Shoshone.....	361	344	130	---	12	---	25	---	---	33	8	16
Arapaho.....	334	301	39	10	12	---	240	---	---	33	8	---

1 1935 data.

2 1934 data.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Arizona:				
Colorado River Agency:				
Mohave.....	22	18	B-5	Day.
Fort Apache Agency:				
Canyon.....	32	20	B-3	Do.
Cibecue.....	62	33	B-5	Do.
Fort Apache (Whiteriver).....	128	96	B-9	Reservation boarding.
Do.....	185	145	B-9	Day.
Theodore Roosevelt.....	294	266	B-9	Reservation boarding.
Hopi Agency:				
Chimopovy.....	68	63	B-6	Day.
Hotevilla-Bacabi.....	129	113	B-9	Do.
Moencopi.....	86	74	B-6	Do.
Oraibi.....	98	90	B-8	Do.
Polacca.....	137	123	B-8	Do.
Toreva (Second Mesa).....	69	63	B-6	Do.
Navajo Agency:				
Chin Lee Area:				
Chin Lee.....	149	142	B-6	Reservation boarding.
Denehotso.....	51	23	B-4	Day.
Lukachukai.....	99	54	B-4	Do.
Rock Point.....	40	19	B-3	Do.
Rough Rock.....	40	21	B-2	Do.
Fort Defiance Area:				
Fort Defiance.....	298	287	B-6	Reservation boarding.
Do.....	1	1	B-6	Day.
Crystal.....	51	33	B-6	Do.
Hunters Point.....	35	23	B-2	Do.
Saw Mill.....	45	24	B-2	Do.
Keams Canyon Area:				
Keams Canyon.....	171	163	B-6	Reservation boarding.
Pinyon.....	28	20	B-2	Day.
Steamboat Canyon.....	60	38	B-3	Do.
Klagetoh Area:				
Cornfields.....	59	46	B-5	Do.
Greasewood.....	55	33	B-3	Do.
Kinlichee.....	62	45	B-3	Do.
Klagetoh.....	52	40	B-2	Do.
Pine Springs.....	56	20	B-6	Do.
Wide Ruins.....	53	34	B-3	Do.
Leupp Area:				
Leupp.....	296	249	B-9	Reservation boarding.
Do.....	19	7	B-7	Day.
Red Lake.....	42	28	B-3	Do.
Seba Dalkai.....	43	23	B-4	Do.
Tuba City Area:				
Kaibeto.....	27	12	B-5	Do.
Kayenta.....	24	9	B-3	Do.
Moenave.....	9	6	B-3	Do.
Navajo Mountain.....	26	11	B-3	Do.
Shonto.....	17	10	B-5	Do.
Tuba City.....	316	279	B-8	Reservation boarding.
Do.....	15	3	B-6	Day.
Phoenix:				
Phoenix.....	521	467	7-12	Nonreservation boarding.
Phoenix Sanatorium.....	97	55	B-8	
Pima Agency:				
Blackwater.....	70	54	B-5	Day.
Casa Blanca.....	112	92	B-5	Do.
Fort McDowell.....	22	18	B-6	Do.
Gila Crossing.....	66	57	B-6	Do.
Maricopa.....	34	24	B-6	Do.
Pima Central (Sacaton).....	280	212	B-10	Do.
Santan.....	118	91	B-5	Do.
Salt River.....	187	165	B-10	Do.
San Carlos Agency:				
San Carlos.....	138	85	B-9	Reservation boarding.
Do.....	325	261	B-9	Day.
Sells Agency:				
Chui Chiuschu.....	30	19	B-4	Do.
Fresnal Canyon.....	13	8	B-4	Do.
Kerwo.....	55	26	B-3	Do.
Poso Redondo.....	43	26	B-4	Do.
Quajote.....	30	18	B-3	Do.
Santa Rosa Ranch.....	30	22	B-6	Do.
Santa Rosa.....	153	103	B-6	Do.
Sells.....	176	120	B-6	Do.
Ventana.....	39	32	B-3	Do.

TABLE 4.—Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Arizona—Continued.				
 Truxton Canyon Agency:				
Havasupai.....	23	19	B-6	Day.
Peach Springs.....	26	22	B-5	Do.
Truxton Canyon.....	212	196	B-8	Reservation boarding.
California: Sherman.....	727	695	9-12	Nonreservation boarding.
Colorado:				
 Consolidated Ute Agency:				
Towaoc.....	60	52	B-5	Day.
Southern Ute.....	209	197	B-8	Reservation boarding.
Florida:				
 Seminole Agency: Seminole.....				
	23	9	B-4	Day.
Idaho:				
 Fort Hall Agency:				
Bannock Creek.....	24	22	B-9	Do.
Lincoln Creek.....	20	18	B-10	Do.
Ross Fork Creek.....	28	20	B-9	Do.
Fort Lapwai Sanatorium.....	187	76	B-11	
Iowa:				
 Sac & Fox Sanatorium.....				
Fox.....	53	32	B-7	
Mexquakie.....	28	16	5-8	Do.
	68	47	B-4	Do.
Kansas: Haskell.....	673	605	9-12	Nonreservation boarding.
Minnesota:				
 Consolidated Chippewa Agency: Pine Point.....				
	77	52	B-8	Day.
 Pipestone.....				
	272	253	B-9	Nonreservation boarding.
 Red Lake Agency: Cross Lake.....				
	111	104	B-7	Day.
Mississippi:				
 Choctaw Agency:				
Bogue Chitto.....	51	30	B-5	Do.
Bogue Homo.....	12	8	B-6	Do.
Conehatta.....	63	43	1-7	Do.
Pearl River.....	82	67	1-9	Do.
Red Water.....	60	52	B-9	Do.
Standing Pine.....	34	22	B-6	Do.
Tucker.....	57	37	B-9	Do.
Montana:				
 Rocky Boy's Agency:				
Haystack Butte.....	69	39	B-11	Do.
Parker Canyon.....	33	29	B-6	Do.
Rocky Boy.....	23	13	B-3	Do.
Sangrey.....	68	37	B-6	Do.
Sawmill Camp.....	78	37	B-6	Do.
 Tongue River Agency:				
Tongue River.....	21	17	B-7	Do.
Do.....	80	73	B-8	Reservation boarding.
Birney.....	44	33	B-6	Day.
Muddy Creek.....	7	6	1-8	Do.
Nevada:				
 Carson Agency:				
Carson.....	494	402	B-12	Nonreservation boarding.
Fallon.....	26	22	B-2	Day.
Fort McDermitt.....	29	27	B-6	Do.
Lovelock.....	24	17	B-6	Do.
Nevada.....	77	61	B-8	Co.
Walker River.....	81	65	1-8	Do.
New Mexico:				
 Jicarilla Agency:				
Jicarilla Sanatorium.....	48	44	B-6	
Jicarilla-Apache.....	93	84	B-6	Reservation boarding.
 Mescalero Agency:				
Mescalero.....	122	93	B-6	Day.
Whitetail-Apache.....	39	29	B-6	Do.
 Navajo Agency:				
 Crown Point Area:				
Crown Point.....	341	287	B-6	Reservation boarding.
Lake Valley.....	34	15	B-3	Day.
Pueblo Alto.....	31	18	B-3	Do.
Standing Rock.....	34	19	B-3	Do.
Torreon.....	59	33	B-4	Do.
White Horse Lake.....	26	17	B-4	Do.
 Shiprock Area:				
Aneth.....	38	19	B-6	Do.
Biclabito.....	40	27	B-3	Do.
Cove.....	36	23	B-3	Do.
Huerfano.....	35	14	B-3	Do.
Redrock.....	72	44	B-1	Do.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued*

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
New Mexico—Continued.				
Navajo Agency—Continued.				
Shiprock Area—Continued.				
San Juan.....	331	280	B-8	Reservation boarding.
Do.....	111	76	1-8	Day.
Tecnospos.....	61	36	B-3	Do.
Toadlena Area:				
Burnhams.....	46	27	B-3	Do.
Nava.....	61	44	B-4	Do.
Sanostee.....	63	53	B-4	Do.
Toadlena.....	223	205	B-6	Reservation boarding.
Do.....	2	2	5	Day.
Tohatchi Area:				
Coyote Canyon.....	27	17	B-3	Do.
Mexican Springs.....	59	36	B-2	Do.
Naschitti.....	70	37	B-2	Do.
Tohatchi.....	152	91	B-6	Do.
Fort Wingate Area:				
Baca.....	43	32	B-3	Do.
Canoncito.....	42	35	B-3	Do.
Chechilgeetho.....	49	21	B-3	Do.
Wingate Vocational High.....	597	469	7-12	Reservation boarding.
Iyanbito.....	30	16	B-5	Day.
Mariano Lake.....	34	19	B-4	Do.
Pinedale.....	25	17	B-3	Do.
United Pueblos Agency:				
Albuquerque.....	785	704	7-12	Nonreservation boarding.
Acomita.....	100	86	B-6	Day.
Chicale.....	33	25	B-6	Do.
Cochiti.....	46	46	B-6	Do.
Encinal.....	16	14	B-5	Do.
Isleta.....	130	108	B-6	Do.
Jemez.....	36	34	1-3	Do.
Jemez Mission.....	31	27	B-3	Do.
Laguna.....	67	58	B-6	Do.
McCartys.....	67	60	B-6	Do.
Mesita.....	21	12	B-6	Do.
Nambe.....	30	29	B-6	Do.
Nutria.....	23	20	B-5	Do.
Paguate.....	80	65	B-6	Do.
Paraje.....	42	35	B-5	Do.
Picuris.....	27	25	B-6	Do.
Sandia.....	16	15	B-6	Do.
San Felipe.....	63	55	B-7	Do.
San Juan.....	91	77	B-6	Do.
San Ildefonso.....	24	22	B-5	Do.
Santa Ana.....	36	34	B-6	Do.
Santa Clara.....	65	60	B-6	Do.
Santa Domingo.....	140	122	B-6	Do.
Santa Fe.....	522	452	7-12	Non reservation boarding.
Seama.....	22	19	B-6	Day.
Sia.....	22	21	B-5	Do.
Taos.....	172	150	B-9	Do.
Tesuque.....	21	19	B-2	Do.
Zuni.....	194	169	1-10	Do.
North Carolina:				
Cherokee Agency:				
Cherokee.....	152	124	1-10	Reservation boarding.
Do.....	195	161	B-10	Day.
Big Cove.....	37	19	B-5	Do.
Birdtown.....	61	41	B-7	Do.
Snowbird.....	23	18	B-5	Do.
Soco.....	102	69	B-6	Do.
North Dakota:				
Bismarck.....	114	109	6-9	Nonreservation boarding.
Fort Berthold Agency:				
Independence.....	46	30	B-10	Day.
Nishu.....	35	21	B-10	Do.
Shell Creek.....	59	43	B-10	Do.
Fort Totten Agency:				
Fort Totten Preventorium.....	121	92	B-10	Reservation boarding.
Fort Totten.....	36	27	B-10	Day.
Standing Rock Agency:				
Little Eagle.....	107	85	B-10	Do.
Turtle Mountain Agency:				
Turtle Mountain Consolidated.....	536	484	B-10	Do.
Dunseith no. 5.....	75	64	B-6	Do.
Roussin.....	91	62	B-4	Do.
Wahpeton.....	398	305	1-11	Nonreservation boarding.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued*

State, agency, and school	Enrollment	Average attendance	Grades taught	Class of school
Oklahoma:				
Cheyenne & Arapaho Agency:				
Cheyenne & Arapaho.....	193	177	1-9	Reservation boarding.
Do.....	15	10	1-9	Day.
Chillico	741	534	7-12	Nonreservation boarding.
Kiowa Agency:				
Fort Sill.....	185	155	B-9	Reservation boarding.
Riverside.....	233	206	B-9	Do.
Pawnee Agency:				
Pawnee.....	214	201	B-8	Do.
Quapaw Agency:				
Seneca.....	254	241	1-9	Do.
Five Civilized Tribes Agency:				
Carter Seminary.....	206	161	B-9	Nonreservation boarding.
Euchee.....	157	123	B-9	Do.
Eufaula.....	159	147	B-9	Do.
Jones Academy.....	207	178	B-9	Do.
Wheelock Academy.....	144	132	B-9	Do.
Sequoyah	392	367	B-12	Do.
Oregon:				
Salem	374	293	1-12	Do.
Warm Springs Agency:				
Burns.....	45	36	B-8	Day.
Warm Springs.....	150	143	B-10	Reservation boarding.
South Dakota:				
Cheyenne River Agency:				
Bridger.....	16	11	B-6	Day.
Cheyenne River.....	223	190	B-10	Reservation boarding.
Do.....	34	26	B-10	Day.
Cherry Creek.....	42	28	B-6	Do.
Green Grass.....	20	11	B-6	Do.
Moreau River.....	24	13	B-6	Do.
Thunder Butte.....	31	21	B-6	Do.
Red Scaffold.....	55	34	B-8	Do.
Flandreau	457	437	10-12	Nonreservation boarding.
Pierre	302	264	1-9	Do.
Pine Ridge Agency:				
Oglala Community High.....	482	357	B-12	Reservation boarding.
Do.....	172	124	B-12	Day.
No. 4.....	18	14	B-6	Do.
No. 5.....	51	29	B-6	Do.
No. 6.....	32	22	B-6	Do.
No. 7.....	31	20	B-6	Do.
No. 9.....	37	20	B-6	Do.
No. 10.....	18	6	B-6	Do.
No. 12.....	17	9	B-6	Do.
No. 13.....	18	8	B-6	Do.
No. 15.....	25	18	B-4	Do.
No. 16.....	43	28	B-4	Do.
No. 22.....	23	11	B-4	Do.
No. 23.....	22	15	B-4	Do.
No. 24.....	62	34	B-4	Do.
No. 25.....	22	12	B-4	Do.
No. 26.....	18	10	B-5	Do.
American Horse.....	113	81	B-8	Do.
Grass Creek.....	16	9	B-4	Do.
Kyle.....	175	122	B-9	Do.
Red Shirt Table.....	31	21	B-6	Do.
Slim Butte.....	32	22	B-6	Do.
Wakpamni Lake.....	11	9	1-6	Do.
Rosebud Agency:				
Blackpipe.....	28	16	B-4	Do.
Greenwood.....	38	29	B-8	Do.
He Dog.....	160	100	B-8	Do.
Little Crow's.....	25	18	B-6	Do.
Milk's Camp.....	31	23	B-5	Do.
Ring Thunder.....	30	21	B-6	Do.
Rosebud.....	231	184	1-11	Reservation boarding.
Agency.....	70	45	1-8	Day.
Soldier Creek.....	31	19	B-6	Do.
Spring Creek.....	32	12	B-6	Do.
Utah:				
Palute Agency:				
Goshute.....	43	31	B-8	Do.
Kaibab.....	20	13	B-6	Do.
Uintah and Ouray Agency:				
Uintah.....	82	58	B-8	Reservation boarding.
Do.....	79	58	B-9	Day.

TABLE 4.—*Indian schools, classification and statistics for fiscal year ended June 30, 1936—Continued*

State, agency, and school	Enroll- ment	Average attend- ance	Grades taught	Class of school
Wisconsin:				
Keshena Agency:				
Neopit.....	38	26	B-8	Day.
Great Lakes Agency:				
Lac du Flambeau.....	165	142	1-9	Do.
Wyoming:				
Shoshone Agency:				
Shoshone.....	194	141	B-10	Do.

SCHOOL SUMMARY

Class	Number of schools	Enroll- ment	Average attendance
Total	249	26,248	21,006
Nonreservation boarding.....	19	7,645	6,628
Reservation boarding.....	28	6,396	5,486
Day.....	198	11,822	8,685
Sanatorium.....	4	385	207

OFFICE OF EDUCATION

(Dr. J. W. STUDEBAKER, *Commissioner*)

FOREWORD

Next year the United States Office of Education will be 70 years old. From Henry Barnard's first report of the Commissioner of Education to Congress, we read:

It is obvious that neither constitutional provisions, legislative enactments, nor the existence of the most perfect schoolhouses, will secure the right education of the children of the Nation, without a body of teachers devoted to the work of public instruction, possessing in a sufficient degree, the requisite qualifications of character, attainments, and skill.

The first Commissioner's statement brings renewed appreciation of the view that while equipment and the application of educational methods change, educational principles hold fast throughout the ages.

In the present report of the Commissioner of Education, Commissioner Barnard's statement of principle may well be re-affirmed. The teacher's place in education today is as paramount as it was in 1867.

In "constitutional provisions", "legislative enactments", "most perfect schoolhouses" and other equipment and the application of educational methods, 70 years have brought many changes.

This report presents a review of some of these changes and measures of educational progress that have been noted throughout the Nation during the period from July 1, 1935, to June 30, 1936.

I. GENERAL OUTLOOK IN EDUCATION

1. DEVELOPMENTS DURING THE YEAR

IN PUBLIC SCHOOLS

It is evident that the Nation's public schools are entering upon a new period of development and progress. Reports received from a majority of State departments of education show that fewer States this year than during the two or three preceding years were in need of Federal funds to keep their schools in operation. Funds for current expenses and for capital outlay were increased over those of 1 or 2 years ago in a large number of communities. Teachers' salaries in both rural and urban communities and expenditures for

operation and maintenance of school plants also showed increases, as well as capital outlay which was greatly increased by the use of P. W. A. funds.

In the early years of the depression when school boards were frantically seeking means to reduce expenses, many worth-while activities and services were curtailed or even eliminated. But the following are being gradually restored: Kindergartens, schools and classes for handicapped children, night schools, art, music, home economics, physical education, and health programs.

While enrollments in the lower grades of the elementary schools have been decreasing due to the falling birth rate, enrollments in the secondary schools have been increasing. The increase in the latter type of school is owing in part to larger initial enrollments and in part to retention of high-school pupils for longer periods of time through a smaller number dropping out.

Elementary and secondary school curriculums are reflecting the social changes throughout the country. Objectives are being stated in terms of increased opportunities for social well-being, and of the maximum development of each individual as contrasted with confining curriculum goals to the mere achievements in school subjects.

Both in the field of elementary and secondary education the application of measurement to education has been growing. This growth is due in part to the fact that the use of tests in the classroom or guidance situation is becoming better defined and understood.

The movement to extend educational services to preschool children and adults should be noted. Largely due to the widespread emergency nursery-school program as well as to research in child development, educators and parents are recognizing the values of preschool education. The emergency nursery schools are furnishing a valuable demonstration in the public care of very young children. In time such schools will doubtless become an integral part of the public-school system. Adult education is being promoted along cultural, recreational, and vocational lines.

Turning to school finance, the past fiscal year is one of unusual development. A number of legislatures meeting in 1935 materially revised their State school support plans and the revised plans were in operation for the first time during the school year 1935-36. Among the most important of such revised school-support plans are those of Arizona, Florida, Michigan, Minnesota, Montana, Nevada, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Utah, Vermont, West Virginia, and Wyoming. The most outstanding feature of the new plans is the provision for a relatively larger amount of funds for the public schools from State-wide sources for the year 1935-36 and succeeding

years, than had been provided previously. The movement in itself is one of great significance to the welfare of the public schools.

This movement toward greater State participation in public-school support appears to be, in most instances at least, a State guarantee that public-school facilities can be made available to all youth rather than a definite attempt to equalize school costs among the local school taxing units, since the additional funds are apportioned in large part as flat grants. That is, the local district receives, under the terms of most of the revised plans, a specified amount per pupil, per teacher, or per other unit; in some cases, however, the ability to pay is also a feature of the new plan.

The States have resorted to various revenue sources for the additional funds. State taxes levied especially for public-school revenue were used to a greater extent than ever before. These include severance, liquor, sales, income, and tobacco. However, the additional funds were derived from the State's general fund in some cases.

Other features of State school finance programs which changed during the year include many specific provisions concerning indebtedness, teachers' salaries, support of libraries, and support for institutions of higher learning.

IN THE COLLEGES

The college year has been marked by distinct evidences of recovery. While no complete figures for 1935-36 are available, it seems safe to say, judging by scattered reports, that the enrollments were back nearly to the 1931-32 figure, the income from endowments had increased slightly above its low, and about half the cut in public funds had been restored. The lowest period for the colleges was the year 1933-34. That year all institutions combined suffered, when compared with 1931-32, an 8-percent decrease in enrollments for the regular academic year, a 9-percent decrease in income from endowments, and a 21-percent decrease in income from public funds.

The Federal student-aid program, which provided jobs to about 110,000 young people in college, a cost of more than \$1,500,000 per month, was of unquestioned help not only to the young people but to the colleges. Much useful work which would otherwise have been left undone was done by these students. At the same time the students were given their rightful chance to continue their education, and they did educational work equal to and in many institutions superior to that done by classmates who were doing no work for wages.

The construction of buildings on college campuses came to an almost complete stop 3 years ago. The Public Works Administration has stimulated the movement to build by approving projects at colleges amounting to about \$60,000,000.

The social science courses experienced a rapid increase in demand during the year. In some institutions enrollments in these courses were double what they were but 4 years earlier. Paralleling this development there was a widespread increase in student forums devoted to discussions of current social, economic, and political issues. And not unrelated to this has been the increase in departments and schools organized to train for public service.

Finally, perhaps the most significant development of the year was the distinct rise in the standards of many of the professions. Demands for higher standards of training for teachers were general. The 2-year teacher training course lost ground in favor of the 4-year teacher training course. Many high schools will not accept as teachers anyone without at least a master's degree. Graduate courses in engineering increased rapidly. Special institutes for alumni became more common. Colleges generally have felt the urge to meet the more exacting demands of modern business, scientific, and professional life.

PROVISIONS FOR YOUTH

Significant has been the growth of interest on the part of educators and community leaders in the problems of out-of-school youth. The newer development in education is a growing sense of community responsibility toward youth to the end that the school and other agencies of the community provide programs leading definitely toward establishment of the young person vocationally, socially, and in other ways of normal community living.

The increase in guidance and counselling services of the schools, the development of placement programs, the increased emphasis upon vocational training in the curriculum to prepare for work, and the growth in the number of part-time and evening school classes of both a vocational and general character are indicative of educational provisions attracting many young persons in their attempt to become more fully established.

One of the striking developments of last year has been the number of such surveys completed on State, city, county, and community bases. These surveys have been instrumental in the establishment or extension for out-of-school youth of many educational provisions, such as emergency colleges, university extension classes, group correspondence courses, high-school classes for post-graduates, library reading courses, radio broadcast classes, youth forums, educational clubs, community schools, trade and part-time cooperative classes, art and handicraft classes, training for household service, part-time classes in vocational home-making and vocational agriculture, and commercial training of diversified types. These educational develop-

ments have attracted large numbers of young persons from the out-of-school group.

The passage of the George-Deen Act, to extend vocational education opportunities throughout the United States, represents still another of the newer developments of interest with respect to education for out-of-school youth.

2. PARTICIPATION IN EMERGENCY EDUCATION ACTIVITIES

CIVILIAN CONSERVATION CORPS

The educational program in the Civilian Conservation Corps has made significant and steady progress during the past fiscal year. Objectives of the program have become clearer and more practical, its administration and supervision have been strengthened, and experience in camp work has developed many new and successful practices.

Approximately 75 percent of the enrollees are now voluntarily participating in some form of educational activity. The objectives as now defined are: Elimination of illiteracy; removal of deficiencies in common school subjects; training on the job; general vocational training; avocational training; cultural and general education; health and safety education; character and citizenship training; and assisting enrollees in finding employment.

The essential items in the plan for the educational program adopted November 22, 1933, by the Emergency Conservation Work Administration, provided that the Office of Education would act in an advisory capacity to the War Department in all matters affecting the educational program. A director of C. C. C. camp education was appointed by the United States Commissioner of Education to select and supervise corps area and camp educational advisers, and to recommend to the Secretary of War the outlines of instruction, teaching procedures, and types of teaching materials for use in the camps.

The original plan also provided for the appointment of a corps area educational adviser in each of the nine corps areas to act in an advisory capacity to the corps area commander on educational matters. An assistant corps area adviser was authorized and assigned to each of the nine corps areas in the beginning of the fiscal year.

Until July 1935 corps area educational advisers were called upon to supervise the educational work of all the camps in their corps areas. The authorization of district educational advisers during this year completed the chain of organization and provided for more adequate supervision of the work. District commanders, aided by their district advisers, were able to provide better training for camp advisers and

thus to develop more satisfactory programs. The appointment of these educational officials is probably the greatest forward step since the inception of the program.

The quota of camp advisers varied greatly during the year, due to the fluctuation in the size of the corps, as is shown by the following table:

	July 1935	October 1935	January 1936	April 1936	June 1936
Number of companies.....	2, 270	2, 440	2, 164	2, 121	2, 105
Quota of advisers.....	2, 000	2, 200	2, 000	1, 900	1, 902
Number of advisers on duty.....	1, 336	2, 118	1, 951	1, 834	1, 848

During the year 1,321 advisers were appointed. A study of the personnel records of these men shows that all are college graduates, 74 percent have bachelor degrees, 23 percent master degrees, and 3 percent have doctor degrees. Over half of them have majored in education and the social sciences during their college years. Approximately 60 percent had previous experience in teaching, and 12 percent had administrative school work. About 40 percent had business or industrial experience.

The duties and responsibilities of camp educational advisers have been more clearly defined during the year and may be classified briefly under 12 major headings: Study and investigation; counseling, guidance, and placement; cooperative planning; promotion of new educational activities; administration of the program; teacher and leader training; improving physical equipment; teaching enrollees; maintaining community contacts; promotion of recreational activities; paper work; and miscellaneous (special duties assigned by company commanders).

Committees on education.—In order to obtain the active interest and cooperation of the military and technical personnel, committees on education have been organized in a large number of camps. In several corps areas, these committees were organized in all camps by order of the corps area commander. The committee consists of the company commander, project superintendent, educational adviser, and an outstanding enrollee. Its purpose is to develop the educational program in all its phases during the work hours and in the leisure time of the enrollees.

Counseling and guidance.—The success of a camp educational program depends primarily upon the effectiveness of the camp adviser's work in counseling and guidance. The first duty of the adviser in this respect is to interview enrollees upon their first arrival in the camp. Enrollees having common interests are then organized into groups for work under competent leaders. Those requiring in-

dividual treatment receive personal attention from competent persons.

Elimination of illiteracy.—Analyses of the educational level of enrollees reveal that approximately 2½ percent have been illiterate. Naturally elimination of illiteracy has been considered one of the primary objectives of the program. In October 1935 the Office of Education issued a publication suggesting a number of techniques and materials that had been found to be of value in instructing illiterate enrollees. The Ninth Corps Area educational adviser's office published a text designed specifically for use in the C. C. C. camps. Results achieved in this field are shown in the following table:

	July 1935	October 1935	January 1936	May 1936
Number of illiterates.....	7,369	11,283	10,927	7,852
Number learning to read and write.....	6,521	9,078	9,169	7,017
Percentage.....	88	80	84	89

It is estimated that 35,000 illiterate enrollees have been taught to read and write since the start of the C. C. C.

Educational level of enrollees.—The educational level of enrollees varies considerably in each camp and corps area, but on a country-wide basis, there has been little or no change from month to month in the percentage of enrollees on each level. The proportion for each school grade is given in the following table:

	July 1935	October 1935	January 1936	May 1936
Illiterate.....	2.5	2.5	2.5	2.5
Elementary.....	23.9	28.5	28.4	28.5
High school.....	55.1	52.7	53.0	54.0
College.....	18.4	16.2	16.0	15.0

The following table indicates the enrollment in academic courses for 3 selected months during the year:

Enrollment	October 1935	January 1936	May 1936
Elementary subjects.....	80,016	90,695	77,343
High-school subjects.....	114,728	101,584	83,485
College subjects.....	8,071	7,078	6,020

There are more than 60 major types of work in which the Civilian Conservation Corps is engaged. These major classifications may be broken down into more than 300 jobs for training purposes. The

number of enrollees receiving such planned instruction is shown in the following table:

	July 1935	October 1935	January 1936	April 1936	June 1936
Enrollees receiving job training.....	135, 065	188, 783	234, 706	195, 280	215, 320

To supplement the vocational instruction gained through job training, courses have been arranged in the camp schools which contain more detailed and advanced vocational material. To help improve the content of these courses, the Office of Education issued to the camps 15 lesson outlines dealing with such subjects as agriculture, auto repair, carpentry, cooking, mechanical drawing, radio servicing, and plane surveying. A Manual for Instructors was also distributed to all companies.

The number of enrollees receiving vocational training is as follows. (The figure for July is estimated.) More than 50 percent of the courses are vocational in nature.

	July 1935	October 1935	January 1936	April 1936	June 1936
Enrollment in vocational courses.....	120, 000	162, 393	229, 146	206, 962	215, 642

It is estimated that approximately 40 percent of C. C. C. enrollees are from rural communities and in all probability the larger proportion will engage in farming as their life work. Agricultural education was stressed during the spring of 1936. The interest and cooperation of the Department of Agriculture's Extension Service and of the Vocational Division of the Office of Education were secured and suggestions for establishing or improving agricultural courses were sent out to all camps. The formation of practical projects in gardening, poultry raising, dairying, and other agricultural activities was encouraged. As a result, about 50 percent of the companies now offer agricultural courses.

Camp libraries have been expanded to the extent that 350,000 books are circulating monthly and over 150,000 men are regularly engaged in reading. Nearly 10,000 educational films dealing with a wide variety of subjects are being shown to enrollees every month. More than 1,600 camps now publish camp newspapers. Instruction in the duties and responsibilities of citizens is given in a large number of camps, and forum and debating groups have proven popular. A recent survey indicated that more than half the camps have organized an open forum or debating society.

The number of teachers supplied by the Works Progress Administration and the National Youth Administration increased from 1,321 in October 1935 to 2,316 in March 1936, which represents a per company increase of 93 percent. The number of regular school teachers who acted as volunteer unpaid instructors of enrollees increased from 143 in July 1935 to 398 in June 1936. The number of laymen who acted as regular instructors averaged about 1,400 per month. School authorities in a large number of cases have placed their buildings, libraries, gymnasiums, and playgrounds at the service of the enrollees. Colleges and universities have extended needed assistance in the field of higher education.

The basic purpose of the educational program is to return enrollees to their home communities better equipped mentally and morally for their duties as citizens and with a better knowledge of the Government under which they live and of all that that Government means. The C. C. C. officials, therefore, in addition to offering educational opportunities to the enrollees while in camp are making intensive efforts to assist enrollees to find employment upon their return home.

To assist in the work of satisfactorily adjusting enrollees to community conditions and in helping them locate work, advisers in several corps areas have fostered the formation of community guidance and placement councils.

The efforts of C. C. C. officials to help C. C. C. men bridge the gap between camp and employment are undoubtedly winning substantial results. Camp authorities are deeply gratified over a recent report from Director Robert Fechner's office indicating that 145,531 men left the corps during the year of 1935 to accept employment.

WORKS PROGRESS ADMINISTRATION

The Works Progress Administration has sent over 60 projects involving research and experimentation in education and educational psychology to the Office of Education for review and recommendation regarding their technical and practical aspects. These projects involved research in many different areas of education, such as instruction, guidance, failures, buildings, etc., and each involved expenditures ranging from about \$1,000 to over \$50,000. Members of the staff of the Office of Education reviewed these projects and made recommendations.

PUBLIC WORKS ADMINISTRATION

Information concerning public-school building activity, school-district indebtedness, and other phases of school administration has been supplied from time to time upon request of the Public Works Administration. Publications of the Office, particularly those dealing

with school finances and statistics, have been furnished the P. W. A. A number of personal interviews and conferences concerning school buildings and records have been held with P. W. A. staff members throughout the year.

II. THE OFFICE OF EDUCATION DURING 1935-36

1. NEW SERVICES

SPECIAL PROJECTS

Five special projects made possible through Federal relief funds have been administered by the Office of Education during the year. These projects include public forums, educational radio, research in universities, survey of vocational education and guidance of negroes, and local school units. The first two of these projects are herewith reported, while the other three are reported under sections dealing with research.

Public forums.—With the allocation of \$330,000 of Federal relief funds the Office of Education, under the general direction of the Commissioner, has established 10 forum demonstration centers in 10 different States well distributed geographically across the country. The following communities are included in this program: Manchester, N. H.; Schenectady, N. Y.; Monongalia County, Morgantown, W. Va.; Hamilton County, Chattanooga, Tenn.; Wichita, Kans.; Minneapolis, Minn.; Colorado Springs, Colo.; Orange County, Santa Ana, Calif.; Little Rock, Ark.; and Portland, Oreg. The gross population served by these 10 projects is approximately 2,000,000.

The record of the first three centers to get under way, for an initial period of 5 months, is as follows: Manchester, N. H.—91 meetings, 5,856 attendance; Colorado Springs, Colo.—162 meetings, 13,369 attendance; Monongalia County, W. Va.—184 meetings, 7,879 attendance. Approximately 50 unemployed persons were engaged during this period in these 3 projects.

Each project, in addition to organizing and managing neighborhood forum meetings, promoted the reading of important books on public affairs, the extended use of the library, the distribution of pamphlet material, the discussion of public questions on the radio or in the newspapers and in a score of other ways contributed to a community-wide development of adult education. Approximately 40 competent forum leaders will be engaged in the 10 projects during the coming fall and winter period, leading about 5,000 meetings, at which a total attendance of between 350,000 and 500,000 people is anticipated.

In each of the centers the board of education or a group of representative educational authorities constituting a special forum board

functions as the policy-making body. In addition, a citizens' advisory committee has been formed in each center with a membership of 25 or more citizens representing a fair cross section of community organizations. Selection of forum leaders and relief staff has been made by the local administrator with the approval of the policy-making board and the board of advisors. In each case the local project administrator is the superintendent of schools for the recognized local agency of public education. This administrator serves in this capacity without compensation from the Federal Government, but is appointed by the Department of the Interior.

The local agencies of education are responsible for providing supervisory personnel without cost to the project where it is needed to augment the activities of the paid forum leaders.

The response to the public-forum project has been Nation-wide. Hundreds of educators and others in positions of authority have petitioned the Office of Education for such assistance in the development of similar programs. A heavy correspondence has developed as a result of the announcements of these projects indicating a vital interest on the part of thousands of people in adult civic education.

Educational radio.—The experience of the Office of Education with a weekly radio service during the past 3 years led to the establishment, at the end of 1935, of the educational radio project. This project is producing five new experimental weekly educational programs, the first of which went on the air March 1936.

These programs were launched by means of a grant of \$75,000 from emergency funds and through the cooperation of the National Broadcasting Co. and the Columbia Broadcasting System. The grant made possible the assembling of a group of experts from the radio industry, as well as the employment of more than 60 unemployed radio actors, script writers, and technicians. The networks' contributions of thousands of dollars' worth of equipment, facilities, and time brought these programs to listeners in communities from coast to coast.

Primary aims of these services are to discover new methods of educational broadcasting and to pass along the lessons learned to educators all over the country, who have appealed to the Office of Education for some solution of their local problems.

Enthusiastic response of listeners—who have written thousands of letters of commendation in the first 5 months of the project—indicate that what used to pass for educational broadcasting is inadequate and that new techniques of broadcasting will recruit mass listeners for education. Important also is the discovery that effective broadcasting stimulates educational activity and results in greater use of libraries and wider distribution of Government publications.

Tentative conclusions of the first few months of experience with this new art show that (1) the techniques of broadcasting school subjects need more intense investigation, but that (2) radio, properly used, is a most valuable medium for bringing to masses of people messages of culture, of conservation, of government, of health, of safety. Further research on these problems should reveal methods for more successful, valuable, educational broadcasting.

STATE SCHOOL SPECIALIST

A senior specialist in State school systems was added to the Office and assigned to the American School Systems Division the past year. The duties of the new specialist include the initiating and conducting of studies of practices and problems of State school administration and coordinating resources and services of other divisions and specialists of the Office of Education insofar as they have relationships to State school administration. The specialist acts as consultant to State and Territorial superintendents, commissioners, and other school officials in matters of State, Territorial, and local school administration and Federal relations to public schools. He also cooperates with and assists in State studies and surveys of public education, prepares for publication results of surveys and studies relating to State school administration, addresses educational and other organizations on topics concerned with Federal, State, and local administration and support of education.

CONSERVATION EDUCATION

The place of conservation education in the school program, appropriate instructional materials, and means of integrating such materials into the school program through coordination with the established content subjects, through experience units or in other ways, are topics which involve difficult problems for school officers to solve. A new recognition of the importance of the whole broad field of conservation of natural and human resources, its meaning and scope, the necessity of understanding and expressing fundamental school concepts throughout the school program is abroad. The interest of school program makers, supervisors, and teachers has been reflected throughout the year in the form of requests to the Office of Education for definite assistance in formulation of curriculum material. What are the best sources of curriculum materials for conservation teaching? What are prevailing practices throughout the country among school systems in conservation instruction in elementary and secondary schools and in adult programs? are some of the questions received.

During the year the Office has been somewhat unprepared to meet this demand adequately because of limitations of its staff. However,

due to the importance of a better understanding of the far-reaching effects of neglect and exploitation in the past and the belief that only through education can effective steps be taken in bringing about a change of attitude, certain emergency adjustments have been made to meet the immediate needs, at least partially. There have been prepared or are under way bibliographies of instructional materials and methods, information on present practices in school curriculum content, and a preliminary examination of State and other courses of study, with a view to having on file and for dissemination information about present practices in conservation teaching. Under preparation at the present time are outlines and suggestions concerned with instructional material and its use on elementary and secondary levels where the demand just now is most urgent.

NEW LIBRARY DIVISION

Fostered by the American Library Association and endorsed by the Library Association of the District of Columbia, the new Library Division established by act of Congress, this year, brings to fruition plans which have long been considered desirable for the promotion of library service. While the Office of Education since its beginning has been mindful of libraries and their place in the educational scheme, this is a decided stamp of approval given by Congress to a plan for library development by the Office of Education.

The new law provides that the service shall be established for the purpose of "making surveys, studies, investigations, and reports regarding public, school, college, university, and other libraries; fostering coordination of public and school library service; coordinating library service on the national level with other forms of adult education; developing national participation in Federal projects; fostering Nation-wide coordination of research materials among the more scholarly libraries, interstate library cooperation and the development of public, school, and other library service throughout the country."

FEDERAL RADIO EDUCATION COMMITTEE

The development of the so-called American system of broadcasting from its inception to the present day has created many problems and given rise to various difficulties and differing points of view with regard to public uses of this powerful instrumentality of communication. State and local departments of education have experimented to the point where it is estimated that over 200 city-school systems broadcast more or less regularly over local stations.

But with the pressure of private competitive business time on the air, certain differences arose with public educational and nonprofit

agencies which eventually brought extensive hearings by the Federal Communications Commission on the whole subject of educational broadcasting. Commercial stations pointed out that they were already doing a considerable amount of educational and public-service broadcasting and insisted that there was ample time available, especially on the part of local stations, which could be used by educators and public-service agencies, if they could show that they were prepared to broadcast programs which would at least be comparable in public interest to those sponsored commercially.

The Communications Commission advised Congress that in its opinion the present system did provide available free time for educational and public-service broadcasts, and announced that it was creating a national committee with a view to eliminating controversy and misunderstanding and promoting active cooperative relationships between educators and broadcasters. The Commissioner of Education accepted the invitation to become chairman of the committee, which includes 40 representatives of the educational forces, the clergy, labor, nonprofit organizations, and commercial broadcasters.

Prior to the first meeting of the committee, a small representative planning committee met a number of times, took an overview of the major problems involved, formulated certain study projects and incorporated them in an agenda for consideration at the first meeting of the committee as a whole, which was held last February. As a result of the 2-day conference it became evident that a comprehensive study program should be made before definite remedial steps could be taken or even suggested. Three committees were authorized at the meeting to explore possibilities and initiate action before the next meeting of the large committee. The executive committee was organized and in turn appointed a subcommittee to explore the problem of conflicts, while a technical subcommittee was created to define the proposed study projects and develop procedures to be followed in their eventual operation.

Following several meetings of the various committees, a program of some 16 study projects was approved and negotiations begun with several sources of private funds to secure the finances with which to carry them on. After funds are secured a central coordinating agency will be established to administer and coordinate the work of the several studies as they progress.

2. RESEARCH

ORGANIZATION, ADMINISTRATION, AND SUPERVISION

A study made in cooperation with a special committee of the National Society for the Promotion of Engineering Education dealt with the standards and practices of graduate work in engineering

schools. Eighty-two schools of engineering contributed data for the study, which provides the basis for improvement of standards for advanced degrees in the field of engineering. An investigation of the relationship of the State to higher education has been continued as a long-time research project. The statutes of all the States have been examined and extracts from them have been compiled and classified as a basis for a series of studies in this field. A summary publication has been completed, giving for each State a diagrammatic representation of agencies which exercise a controlling influence over institutions of higher education.

A study of junior colleges lists each of the reported junior colleges in the United States, with essential data concerning them. These data include the form of control, the number of teachers, the number of students, the typical expenses required of each student, and reviews the legislation concerning junior colleges in the several States. The regular annual report of land-grant colleges and universities for 1935 was also prepared.

PROGRESSIVE PRACTICES IN RURAL SCHOOLS

A project has been launched to develop a list by States of the smaller rural schools which are known for their progressive or innovating practices and to prepare a series of publications showing the internal organization of such outstanding schools and describing the procedures employed in bringing about improved educational conditions despite the limitations of rural communities. One or more such schools, together with a brief description of the way in which unusual progress was made, have been named by rural-school leaders of most of the States. Further study is now being given to this whole problem with a view to showing practical ways in which rural education may be improved.

RECORDS AND REPORTS

During the past year the Office of Education has directed considerable effort to the cooperative study with the States involving revisions in school records and reports, particularly as related to the State school statistics reported to the United States Office of Education.

The two major objectives in this study are to determine the items of information that should be included in the reports from the States and to formulate basic terminology (with clear definitions) acceptable to the respective States.

SCHOOL HEALTH

In the investigation made of instruction in hygiene, an inquiry was sent to all institutions of higher education listed in the Educational

Directory of the Office of Education. A reply was received from about 65 percent of such institutions. A bulletin entitled "Instruction in Hygiene in Institutions of Higher Education", reports on this study. A study was also made of what the teacher-training institutions are doing in preparing elementary teachers for school health work. Pamphlet No. 67, Training of Elementary Teachers for School Health Work, summarizes this material and includes examples of courses of study offered in some of these institutions. Returns are now being tabulated from questionnaires relative to provision for student-health facilities in institutions of higher education.

FINANCING EDUCATION

In the field of school finance a study of State provisions for equalizing school costs was completed. This study reveals the principal feature of each State school-support system existing in 1933-34. Separate funds are analyzed as to source by States and apportionment methods are described.

A study of educational facilities for children on Federal supervised reservations completed this year shows that a large number of children live on the Government reservations, a majority of whom attend nearby public schools without the payment of tuition; some are obliged to pay tuition in public and private schools, while some others have no school facilities. In a few instances the Federal Government provides schools or pays tuition.

EDUCATION OF EXCEPTIONAL CHILDREN

In the education of exceptional children the year marked the completion of two major projects. The one was Federal Civil Works Administration Project F-90, which was begun in the year 1933-34. When C. W. A. funds were no longer available, the statistical analysis was completed with the assistance of capable workers serving on a voluntary basis. The final report on this is a bulletin entitled "The Deaf and Hard of Hearing in the Occupational World." The purpose of the study was to accumulate data which will be contributory to the better guidance of deaf and hard-of-hearing young people into those occupations for which they are best fitted.

The other major project completed was the preparation of a Guide to Curriculum Adjustment for Mentally Retarded Children. This was the outcome of two special conferences of leaders in the education of retarded children. Contributions to the publication were made by all who participated in the conferences. It is designed especially for those responsible for the education of retarded children in State and local school systems.

NATIVE AND MINORITY GROUPS

The Office has furthered its work in education among native and minority groups in continental United States and its outlying parts through the extension of its advisory service to departments of education in school systems and research organizations in universities; through the preparation and compilation of two additional units in its series of publications on education in outlying parts; and through the initiation and promotion of two projects in coordinated research concerned with language difficulties of bilingual children and their educational results.

Early in the present calendar year a member of the staff in the Special Problems Division responsible for education of native and minority groups spent approximately 2 months visiting schools, conferring and advising with school officials in Hawaii and in the southwestern section of the United States, where bilingualism is a serious problem, especially among children of Spanish-speaking parents. As a result of the survey of schools in Hawaii, a study of education in that Territory, begun the preceding year, was completed and published and is now available. During the visit to the Territorial university in Hawaii and State universities in California and other States, plans were formulated and are now under way for the conduct of coordinated studies concerned with teaching English to bilingual children. The studies are under a specific project known as research in universities and colleges. During the year a study of education in Alaska was prepared for publication. A study and report of the social and economic conditions of the southern Appalachian Mountains and of the educational problems resulting from such conditions was completed during the year. Evidence is presented in the report of the inadequacy and in some areas of the almost total absence of educational opportunities in the southern mountains.

PROGRAMS FOR YOUTH

Activities carried on by the Committee on Youth Problems under the subsidy from the General Education Board were completed during the year and the project officially closed March 31, 1936.

The resulting publications of this committee may be briefly characterized as follows:

BULLETINS

Youth: How Communities Can Help.—Ways in which communities have organized to help meet the problems of unemployed out-of-school youth and a brief description of some of the principal programs evolved in these communities.

Youth: Leisure for Living.—An account of the wide variety of leisure-time activities in which youth engages, with indications of ways in which communities and youth agencies may best join in making the programs more comprehensive and effective.

Youth: Education for Those Out of School.—This description of the programs and activities carried on in the interest of education for youth out of school makes a stimulating challenge not only to the agencies concerned but to the schools as well. The question of what the full responsibility of the schools should be is raised prominently by this bulletin.

Youth: Vocational Guidance for Those Out of School.—In a field of such growing importance as guidance, it is helpful to have this description of vocational guidance programs carried on for out-of-school youth. Various practices used in counseling and job placement are described.

Youth: Finding Jobs.—A description of opportunities which combine earning with learning and an account of the ways in which individuals and communities unite to make and to find jobs for young people.

Youth: Community Surveys.—This bulletin contains (1) an account of the surveys which have been carried on in the past 3 years to ascertain facts about youth, (2) a description of what the techniques involved in making such surveys are, and (3) the results of 13 community surveys which were conducted uniformly in cooperation with the Committee on Youth Problems.

STATISTICAL STUDIES

One of the major functions of the Office of Education, set up in the law under which it was created, is the collection of statistics showing the progress of education. In the United States, where the control and administration of education is a State and local function, the Federal Office of Education acts as the clearing house for statistics and information on a national basis.

In 1935-36 tabulations were completed on the biennial reports for 1933-34 and new information obtained as shown in the following table, in which capital letter "C" stands for data collected and "T" tabulated and "C-T" collected and tabulated within the year.

Subject of study, 1935-36	Type of study		
	Biennial	Periodic	Special
State school systems:			
Personnel and finances.....	T		
Preliminary statistics.....	T		
Revenue receipts by source.....	T		
County school systems:			
Personnel and finances.....	T		
City school systems:			
Personnel and finances.....	T	C-T	
Per capita costs.....		C-T	
School janitor service.....			C
Higher education:			
Personnel and finances.....	T		
Land-grant colleges.....		C-T	
Student health.....			C-T
Instruction in hygiene.....			T
Scholarships.....			C-T
Secondary schools, public:			
Personnel.....	T		
Teaching staff:			
Rural salaries, tenure, and experience.....		T	
Insurance and annuity funds for college.....			C-T
Elementary schools:			
General and special supervisors of instruction.....			C
Nursery schools:			
Personnel.....			C-T

The regular quinquennial study of the status of the personnel employed in the rural schools has been carried on throughout the year. Questionnaires were filled in by about 2,500 rural-school administrators showing the salaries paid to teachers and principals of various classes of rural schools, their training status, their professional experience, etc. The data are now being compiled and prepared for publication.

GUIDANCE

Information on the present status, trends, and problems in guidance and in industrial arts in city-school systems was collected and compiled during the year.

EDUCATIONAL MEASUREMENT

A study of elementary-school graduating examinations was published during the year. A study of the cumulative-record forms used in elementary schools, junior and senior high schools was carried on. For this study the forms used by school systems have been gathered together and the different items analyzed. The study of the status of high-school testing practices was completed. This study gives the actual procedures in using new-type tests, both those constructed in the school and standardized tests.

LEGISLATION

In the field of school legislation two circulars (nos. 145 and 155), each entitled "Legislative Action in 1935 Affecting Education", were prepared, summarizing the principal legislative educational measures enacted into law in the different States. Another, Circular No. 158, entitled, "Legislative Action in 1935 Affecting the Financial Support of Public Education", contains a summary of the characteristic features of legislation in each of the States pertaining to the support of schools, types of taxes levied, changes in the apportionment of school funds, and provisions for the control of public-school expenditures.

PARENT EDUCATION

In the fields of parent education and home-and-school cooperation two studies have been completed and issued: Parent Education Opportunities, Bulletin, 1935, no. 3, describes the parent education activities of the Federal Government, State departments of health and education, public schools, colleges and universities, organizations and institutions having programs in this field which has been developed largely within the past decade. Churches, clinics, social agencies of various kinds, are cooperating in the development of parent education. Significant Programs of High School Parent-Teacher Asso-

ciations, Pamphlet No. 64, discusses the present form and status of high-school parent-teacher associations; programs and service projects, and contains conclusions and recommendations for the consideration of parent-teacher leaders and high-school faculties.

TEACHER TRAINING AND PERSONNEL PROBLEMS

A study of the development of a State program for the certification of teachers conducted during the first half of the year and data concerned certification requirements, and included a bibliography and guiding principles of certification. A selected bibliography on the education of teachers brought up to date volume I of the National Survey of the Education of Teachers, and a comparison was made of salaries of teachers in the land-grant colleges for the years 1928-29, 1929-30, 1930-31, and 1934-35.

Survey of vocational education and guidance of Negroes.—The national survey of vocational education and guidance of Negroes has been conducted by the Office of Education through a grant of \$235,000 from emergency funds. While the primary purpose of the grant was to put to work "white-collar" Negroes who were on relief, the Office of Education has endeavored to make the study contribute to the educational advancement of all Negroes. The survey has filled a long-felt need, and is the outgrowth of many years of interest in the subject on the part of the Office of Education, educational organizations, and individuals.

The study has collected information concerning vocational education and guidance of Negroes with respect to the following items: (1) Vocational offerings in schools of selected communities; (2) vocational offerings by nonschool agencies; (3) evening and continuation schools; (4) training of vocational teachers; (5) vocational teacher-training facilities; (6) prevocational-education programs; (7) vocational-guidance programs; (8) personnel data of students enrolled in vocational courses of the various types of schools and colleges; (9) status of graduates and drop-outs; (10) attitude of students and educational leaders toward the vocational training of the Negro; (11) the conception of students and educational leaders of the Negro's function in American economic life.

The survey, national in scope, has comprised approximately 192 representative urban and rural communities, located in 33 States and the District of Columbia, and including nearly two-thirds of the total Negro population of the United States. A total of 479 persons on relief have been given employment, 205 of whom were male and 274 female. These relief workers had a total of 1,109 dependents. This means that, excluding the 42 nonrelief workers and their dependents, a total of 1,588 persons have benefited directly from the

project. Of the 479 relief workers, 75 had only high-school education, 227 had attended college, 131 had been graduated from college, 34 had done graduate work, and 12 hold the master's degree. Of the nonrelief workers, six hold the Ph. D. degree, or nearly its equivalent, and practically all others hold the master's degree.

The findings of the survey, together with interpretations, conclusions, and recommendations, will be published and made available to school officials, administrators, and other responsible persons interested in vocational education and guidance of Negroes. Also the survey staff is cooperating with a subcommittee of the National Vocational Guidance Association in the production of vocational-guidance manuals for teachers and students, with particular reference to special problems of Negroes.

Local school units.—During the year the Office of Education began a study of the local school-administrative units in 10 States through an allotment of \$844,000 emergency relief funds. The purpose of this project is to determine within each State the possibilities for the organization of more satisfactory schools, attendance areas, and local school-administrative units. It is a most significant research project and is considered particularly timely since more than one-half of the States indicated their interest in having a study made of their local school-administrative units. A number of State departments of education have been carrying on similar studies on a limited basis.

The study of the local school units is well under way in the 10 States, and when completed will reveal existing educational conditions in the present school-district organizations and significant findings, with consequent recommendations pointing to more desirable organizations.

The following States are participating in the project: Arizona, Arkansas, California, Illinois, Kentucky, North Carolina, Ohio, Oklahoma, Pennsylvania, and Tennessee. In each of these States there is a State project director who is a member of the staff of the State department of education and who works in close cooperation with the chief State school officer and with the project staff of the Office of Education. The staff project director, with the assistance of a central staff, directs the activities of workers selected from relief rolls and assigned to the collection and tabulation of the required data and to the preparation of maps and charts needed in the study.

The administrative and supervisory personnel of the 10 States on June 25, 1936, consisted of 10 directors (serving without compensation), 9 associate directors, and 58 assistant directors; and the relief personnel consisted of 1,443 clerical-stenographic workers and draftsmen.

3. STIMULATION AND COORDINATION OF RESEARCH

BIBLIOGRAPHIES, THESES COLLECTION, ETC.

Twelve reference bibliographies were compiled during the year. The file of masters' and doctors' theses in education has grown steadily during the year, on June 30, 1936, numbering 2,203 volumes. About 500 of these were sent out on interlibrary loan during the year.

A selected and annotated bibliography has been prepared on problems of education in the Appalachian Highlands. Other bibliographies in progress deal with supervised correspondence study; status and improvement of the county superintendency; improved practices in rural teaching; education of Negroes; etc.

AID TO STUDENTS OF FOREIGN SCHOOL SYSTEMS

The Comparative Education Division helped in 162 studies, which, classified according to purpose, were:

Professional use.....	26
Doctoral dissertations.....	6
Master's theses.....	10
Theses, grade not given.....	9
Reports of term papers.....	30
Study groups.....	2
Purpose not given; plainly from college students.....	31
Purpose not given; probably from college students.....	39
For high-school students.....	9
Total.....	162

In the classification "Professional use" are included requests from members of college and university staffs, State boards of education, local school boards, and secondary- and elementary-school personnel.

Education in some one country was the subject of most of the theses, term papers, and reports. Requests of this nature related to 26 countries and totaled 96 requests.

Letters of introduction.—With the betterment in economic conditions, larger numbers of educators in the United States are traveling abroad. Many of them ask for letters of introduction from the Office of Education. Sixty-three letters of introduction were prepared for 31 persons of the United States who were traveling abroad last year for study purposes.

Research in universities.—The purpose of this project is to conduct cooperative research in a number of universities having organized graduate work. The universities voluntarily provide administrative and general supervisory services. The institutions employ persons taken from relief rolls who have received college and university training sufficient to enable them successfully to perform the professional and skilled work demanded.

A total allotment of \$500,000, later reduced to \$411,695, was made available to the project. Of the final allotment, \$384,695 was made available to participating institutions and \$27,000 was set aside for administrative expenses. The average estimated cost of each study proposed by the Office of Education was \$1,448.

Fifty-eight universities in 32 States, the District of Columbia, and Hawaii have been conducting project studies. These include some of the largest universities in the country.

The number of paid workers employed under the project increased from 64 on April 2 to 448 on July 30. Over 90 percent of the paid workers have been taken from relief rolls. In addition to paid workers, several hundred university professors and other university-staff members have given their services free to the project.

Most of the 23 studies conducted under the project were outlined and proposed to participating institutions by Office of Education specialists. In addition 11 auxiliary studies, closely related to the 23 basic studies, were being conducted. A third group of studies included 15 investigations proposed by participating institutions, and accepted for cooperative conduct by the Office of Education. The Office studies most popular among the universities included: Student mortality in institutions of higher education, conducted in 33 institutions; economic status of college alumni, 28 institutions; relation between certain factors in high-school education and success in college, 22 institutions; and others.

4. POLICY-MAKING IN EDUCATION

RELATIONS WITH STATE DEPARTMENTS OF EDUCATION

An outstanding function of the Office of Education is to cooperate with State departments of education in the initiation and development of progressive educational practices. Handicapped groups are in serious need of special attention everywhere. Through funds made available by the Federal Government for vocational rehabilitation, physically handicapped adults are given the opportunity to achieve economic independence. The education of handicapped children, however, is not so well assured, its maintenance being borne by State or local school systems, with resulting inadequacy of services in many communities.

The Office of Education has sought continuously to establish in the States sound policies of action with reference to these children that will insure their inclusion in the public-school program of the State. It has sought to clarify the relationship of the education of handicapped children to the vocational rehabilitation of handicapped adults, on the one hand, and to the social-welfare services of the

State, on the other hand. In this connection it has emphasized the following principles: (1) That the program for handicapped children in elementary and junior high schools should be administered and supervised by those who have had training and experience in general educational methods of the elementary school as well as in special techniques demanded for handicapped groups; (2) that the vocational rehabilitation of handicapped adults should be administered by persons specially prepared in vocational education and guidance; (3) that these two functions should be distinct but coordinated activities of the State department of education; and (4) that they should both be administered as distinct from any social-welfare functions of the State. In accordance with these principles, the Office has actively advocated the appointment of one or more qualified persons in each State department of education who will have as a sole responsibility the development of a program on a State-wide basis for the education of handicapped or exceptional children.

MEMBERSHIP ON COMMITTEES ON POLICIES AND STANDARDS

Staff members of the Office of Education have served on the following committees having to do with educational policies and standards: Joint Committee on the Emergency in Education; Committee on Special Group Problems of the National Vocational Guidance Association; advisory committee, division of cooperation in education and race relations, State department of education, Raleigh, N. C.; committee to consider special problems of Negroes for American Youth Commission; special committee of the National Education Association to study the economic status of rural teachers; committee of the National Conference of Supervised Correspondence Study; committee to select books for C. C. C. camps; interdepartmental committee to study relationship among health, education, and welfare services of the Government; National Advisory Committee on Education of Negroes; Technical Advisory Committee of the National Survey of Vocational Education and Guidance of Negroes; American Council on Education's Committee on Standards; National Education Association Committee on Social-Economic Goals of America. Assistance has been given the committee on the improvement of teaching in engineering schools of the Society for the Promotion of Engineering Education, and to innumerable other groups.

CONFERENCES

The Second Conference on Comparative Education and the meeting of the National Committee on Inter-American Intellectual Cooperation were policy-making efforts in the special fields under consideration.

Advisory committee on the reporting of local and State school statistics.—In accordance with a resolution of the National Council of State Superintendents and Commissioners of Education in December 1935, requesting that the Office of Education center its efforts on assisting the States in developing more nearly uniform personnel and financial accounting procedures, the Commissioner continued this committee and authorized regional conferences. The committee met in June 1936, with the senior specialist in State school administration and the statistical division staff for the purpose of determining particularly the items of information to be included in the forms used by the States in reporting statistical data to the Office of Education and in attempting to formulate definitions for the report's terminology.

Portland conference.—The Office of Education conducted a 1-day conference in Portland, Oreg., preceding the meeting of the National Education Association. This conference was held in response to numerous requests from State superintendents and commissioners of education of the States in the Midwest, West, and Northwest. Most of these States are spending considerable effort in revising their recording and reporting schemes within the State to conform to the recommendations of the national committee.

School-building problems.—The specialist in school buildings prepared a program for and took part in the Seventh Annual Conference of the National Advisory Council on School Buildings held in St. Louis in February. The members of this advisory council are appointed by the United States Commissioner of Education and it is made up of nine regional councils.

Three regional conferences on school-building problems were held during the year—one at Ann Arbor, Mich., one at Portland, Oreg., and one at Stanford University, Calif. The purpose of these conferences was to acquaint school superintendents, architects, engineers, and others interested in school-building problems with the work planned by the National Advisory Council on school building problems, to invite discussion of the problems presented, and to secure cooperative action in studying such problems.

Office of Education conferences.—During the past spring a series of conferences was called by the Commissioner for the purpose of bringing together groups of outstanding persons in specific educational fields to consider educational services that might well be undertaken by the Office of Education. Conferences were held in the following fields: Adult civic education, conservation, crime prevention and recreation, curriculum, elementary education, guidance, higher education, industrial arts, school buildings, secondary education, and youth problems. These conferences made valuable contributions to the

Office in the way of bringing out suggestions for improved and extended services.

Local school units.—It is known that in areas of low population density, schools during recent years have suffered serious curtailments in length of terms, instructional programs, supervision, etc. In many areas their very existence has been threatened. While these conditions have been aggravated by the depression, the fundamental causes lie deeper. They are inherent in the prevailing system of administering and financing schools through a multiplicity of school districts too small in human and material resources to maintain efficient school facilities within their borders. Results of a conference called in June 1935, by the Commissioner of Education to consider this problem were compiled during the year and the report was made available for the guidance of State and other school authorities. It sets forth the principles involved in the organization of local school units and desirable policies to be followed.

Industrial arts.—A committee of representative persons in the field of industrial-arts education, appointed by the Office to make a study of the place and function of industrial arts in the public-school program, held a 2-day meeting in Washington and submitted a preliminary draft of its report. The final draft is now in preparation for publication as a bulletin.

5. FIELD SERVICE

CONSULTATIVE SERVICE

At the request of the Board of Education of Danville, Va., which was considering the need of a comprehensive survey of the schools of that city, the Office of Education sent a representative to make a preliminary investigation which resulted in recommendation that the superintendent of schools and the school principals carry on a local survey and called on consulting specialists as the needs arose. The board of education has proceeded upon this recommendation.

A member of the staff conducted school-building surveys for a number of the Resettlement projects and prepared reports advising those in charge of the projects as to their school-building programs.

Considerable field work was necessary in connection with the study of local school-administrative units to comply with the requests of the States for guidance and assistance. This is also true of other special projects.

In the field of health education, a representative of the Office prepared detailed memorandum on health and physical education in the United States for the American Consulate General of New Zealand; advised with inspector of public schools, Department of Education of Toronto, Canada; with State director of physical education of Vir-

ginia; with the State Department of Education of New York; with School Health Service of the N. E. A.; with American Council on Education; and with Boy Scouts of America.

Individual staff members have performed the following consultative services: Conferred and advised with school officials in Hawaii and in the southwestern part of the United States concerning the education of native and minority groups; with State education officials in three States (Iowa, Colorado, Virginia) concerning prospective organization of a State program for the education of exceptional children; acted as consultant for the colored State college curriculum reorganization project, Langston, Okla.; as director of colored high-school curriculum revision project, Oklahoma City, Okla.; as adviser to National Association of Teachers in Colored Schools; as educational consultant and trustee of Knoxville College; prepared outline for Commission of Higher Education of Negroes in Maryland, meeting with the committee and with its executive secretary; assistance was rendered a group of school officials in organizing the New England Industrial Arts Association. A member of the staff is included in the personnel of both the State guidance committee and the committee of city directors of guidance of the National Vocational Guidance Association. In connection with credential evaluation, a representative of the Office attended the Twenty-fourth Convention of the American Association of Collegiate Registrars at Detroit, Mich., in April and visited registrars and committees of admission at the universities of Western Ontario, Michigan, Chicago, Ohio, and Northwestern University at Evanston, Ill.

PARTICIPATION IN MEETINGS

Staff members of a division of the Office of Education which has but four professional members reported giving addresses at 41 national, regional, State, or local conferences, and attending 40 different conferences of organized groups during the year. This gives an indication of the literally hundreds of educational meetings participated in by Office representatives. Among such meetings are those of the American Council on Education; National Education Association; National Congress of Parents and Teachers; American Library Association; Progressive Education Association; National Council of Parent Education; Child Study Association of America; and many others.

The Office of Education was represented at the Fifth International Conference on Public Instruction at Geneva, Switzerland; International Conference on Health of College Students at Athens, Greece; and at the Seventh World Conference of the New Education Fellowship, Cheltenham, England.

The Office of Education aided the Department of State in arranging for official delegates to the following listed meetings abroad:

First Inter-Balkan Conference for the Protection of Children, Athens, Greece; Seventh Pan-American Child Congress, Mexico City, Mexico; Tercentenary Celebration of the Royal Hungarian Peter Pazmany University, Budapest; International Congress of Music Education, Prague, Czechoslovakia; Third International Congress of Open Air Schools, Hannover and Bielefeld, Germany; Fifth International Congress on Public Instruction, Geneva, Switzerland; Twenty-eighth Esperanto World Congress, Vienna, Austria; Seventh World Conference of the New Education Fellowship, Cheltenham, England; International Congress of Medical Advisers for Athletics, Berlin, Germany; Ninth International Congress of Linguists, Copenhagen; Third World Congress for Crippled Children, Budapest, Hungary.

COOPERATION WITH PROFESSIONAL AND PUBLIC-SERVICE GROUPS

Cooperation was continued during the year with the National Committee on Research in Secondary Education and with the Committee on Cooperative Study of Secondary School Standards. A member of the Office staff serves as secretary of these two committees.

Throughout the year the Office of Education has been consulted and called into conference on plans for estimating the population of cities from school census and enrollment data, and all records of this nature have been made available to the Bureau of the Census.

Staff members have: Cooperated with Pan American Union in connection with an educational project in Brazil; cooperated with Division of Territories and Island Possessions in respect to (1) consideration of a cooperative project for exchange of teachers between Puerto Rico and continental United States; (2) reviewing manuscript—History of Japan—at the request of the division; (3) miscellaneous advisory and informational service; cooperated with National Negro Student Health Association; assisted in the organization of a department of guidance in the National Association of Teachers in Colored Schools; cooperated with American Library Association in preparing a program of instruction for Negro teacher-librarians; served on committees in connection with the conference of Associated Country Women of the World, held in Washington this year; evaluated plan for department for the handicapped instituted at Teachers College, Columbia University.

In various capacities the Office of Education has cooperated with a long list of other agencies, including the National Congress of Parents and Teachers, the National League of Women Voters, Ameri-

can Red Cross, Social Security Board, the Associated Country Women of the World, National Education Association, National Council of Parent Education, American Association of University Women, American Council on Education, American Vocational Association, United States Sesqui-Centennial Constitution Commission, American Federation of Teachers, American Legion, Association for Childhood Education, Boy Scouts of America, National Catholic Welfare Conference, General Federation of Women's Clubs, National Safety Council, Progressive Education Association, Young Men's Christian Association, universities and colleges, and other groups, both public and private.

6. PUBLIC INFORMATION SERVICE

PUBLICATIONS AND PUBLICITY

Information on education in its various fields has been made available through many additional avenues during the past year. Bulletins and pamphlets presenting results of research and studies, periodicals giving current information and factual data, news releases on educational activities and developments, educational radio broadcasts, and extensive graphical exhibits have made up the mass of educational information which has gone out to the public from the United States Office of Education.

Statistically summarizing, 46 bulletins, 6 pamphlets, 4 leaflets, 7 bibliographies, 1 reading course, and 10 issues of *School Life*, with 1 supplement, made up the 75 different printed publications issued by the Office of Education during the fiscal year. A total of 57 manuscripts containing 6,506 pages were edited and prepared for printing. More than 300 charts, graphs, maps, and other illustrative material were constructed.

March of Education.—A new periodical, *March of Education*, has been added to the publication roll. This is a news letter over the signature of the United States Commissioner of Education. It circulates monthly to school executives and leaders. *March of Education* high spots in brief some of the significant educational happenings of the month. Its circulation over the first 10 months of its publication has been 12,700 each month.

School Life.—This journal has increased in size this year, from a 24-page to a 32-page monthly publication in order to give more adequate service as the official organ of the Office of Education. New regular features developed during the year have included a more extensive news department for public schools, colleges, and other educational groups; an editorial page by the Commissioner; articles growing out of research by the various divisions of the Office; voca-

tional summary for the month; report of C. C. C. educational activities; and other features.

Cooperation with the press.—The Commissioner of Education during the past year assigned a staff member of the editorial division to be especially responsible for cooperation with the press, in order to develop a wider and more effective use of educational information. The response of the press to this service has been most encouraging and has resulted in a very extensive use of news releases pertaining to educational activities, in newspapers and in other publications throughout the country.

Articles published outside the office.—The Commissioner of Education, the assistant commissioner, and staff members, upon request of organizations and periodicals, prepared for publication during the year, a total of 81 articles dealing with various phases of education.

Radio project.—During the past year the chief of the editorial division has been in charge of the Federal educational radio project of the Office of Education. This project as previously described in this report, has been financed through Federal relief funds and it represents a new effort toward disseminating educational information. There have been weekly broadcasts throughout the year of Education-in-the-News programs and scripts for 15 other series of programs have been developed, bringing the number of radio scripts completed to a total of 173.

Educational exhibits.—The Office of Education sponsored more extensive educational exhibits and publication displays at education conventions, conferences, and meetings during the past year than it has perhaps done in any previous year. In this respect the Office cooperated with many major educational associations and organizations, acquainting their members more fully with the services of the Office of Education with other Government publications on educational matters, etc. Through cooperation of the Government Printing Office this year the Office displayed with its own publications, bulletins, pamphlets, and periodicals of an educational nature available from other Government agencies. Special exhibits and samples of publications were displayed at the California International Exposition. A graphical exhibit of educational development in the United States was presented at the Texas Centennial Exposition. A special Negro education exhibit was also sent to the centennial. Office publication displays and exhibits appeared at conventions of the National Education Association, World Conference for the Crippled at Budapest, National Congress of Parents and Teachers, American Association for Adult Education, National Catholic Educational Association, American Library Association, and at various other gatherings of educational groups.

A mass of correspondence.—In the Editorial Division alone 47,736 letters were received during the past year requesting the various publications, and 338,072 printed publications of the Office of Education were distributed through the Superintendent of Documents. This figure does not include distribution of the periodical publications nor of the mass of mimeographed material issued by the Office nor material sent out directly by the Office.

Mailing lists.—The Editorial Division maintains 259 mailing lists. During the year there were 59 new lists set up and 5 discontinued. The total count of these mailing lists is now 143,227, exclusive of those maintained by the Vocational Education Division.

PUBLICATIONS ISSUED OR PREPARED FOR PRINTING DURING THE YEAR

BULLETINS, 1935

No. 2. Biennial Survey of Education, 1932-34.

Chapters

- II. Statistics of State school systems.
- III. Statistics of city school systems.
- IV. Statistics of higher education.
- VI.¹ Statistics of private elementary and secondary schools.
- VIII.¹ Review of educational legislation.

No. 9.¹ Public education in the Philippine Islands.

No. 10.¹ Public education in Hawaii.

No. 11.¹ Education in Czechoslovakia.

No. 12.¹ Availability of education to Negroes in rural communities.

No. 13.¹ Statistics of the education of Negroes.

No. 14.¹ Federal student-aid program.

No. 15. Reorganization of school units.

No. 16. Elementary-school graduating examinations.

No. 17. Education for democracy—Public affairs forums.

BULLETINS, 1936

No. 1. Educational directory, 1936.

Parts

- I. Principal State and county school officers.
- II.¹ City school officers.
- III.¹ Colleges and universities, including all institutions of higher education.
- IV.¹ Educational associations and directories.

No. 2. Young children in European countries.

No. 3. Junior colleges.

No. 4. State provisions for equalizing the cost of public education.

No. 5. Bibliography of research studies in education, 1934-35.

No. 6. Safeguarding democracy through adult civic education.

No. 7. Instruction in hygiene in institutions of higher education.

No. 8. Graduate work in engineering in universities and colleges in the United States.

¹ Prepared for the printer before July 1, 1935, but delivered by the Government Printing Office during the fiscal year July 1, 1935-June 30, 1936.

- No. 9. Testing practices of high-school teachers.
- No. 10. Scholarships and fellowships.
- No. 11. A guide to curriculum adjustment for mentally retarded children.
- No. 18. Youth:
 - 1. How communities can help.
 - 2. Leisure for living.
 - 3. Education for those out of school.
 - 4. Vocational guidance for those out of school.
 - 5. Finding jobs.
 - 6. Community surveys.

PAMPHLETS

- No. 64. Significant programs of high-school parent-teacher associations.¹
- No. 65. Aids in book selection for elementary school libraries.
- No. 66. Education of teachers: Selected bibliography, June 1, 1932, to October 1, 1935.
- No. 67. Training of elementary teachers for school health work.
- No. 68. What every teacher should know about the physical condition of her pupils (revised).
- No. 69. Per capita costs in city schools, 1934-35.

LEAFLETS

- No. 23. Osteopathy.
- No. 36. Good references on educational legislation.
- No. 37. Physique of school children.
- No. 46. Educational facilities for children on Federal Government reservations, 1934-35.

BIBLIOGRAPHIES

- No. 33. Visual aids in education: Lantern slides, film strips, stereographs, etc.
- No. 34. Pictures, maps, charts, etc., as classroom aids.
- No. 39. Elementary education: Classification, grading, promotion.
- No. 42. Elementary education: Extracurricular activities.
- No. 44. Parent education: History, objectives, methods, and programs.
- No. 45. Child development: Infancy through adolescence.
- No. 48. The activity program.

MISCELLANEOUS

School Life, 10 issues and index.

The whole child. Reading Course No. 32 (revised).

(See Vocational Education Division Report for vocational publications.)

Biennial Survey of Education.—Three of the eight chapters comprising the Biennial Survey of Education, 1932-34, have been completed. Three others—Statistics of State school systems, of city school systems, and of higher education—are at the Government Printing Office.

EVALUATION OF FOREIGN CREDENTIALS AND TRANSLATIONS

Credential evaluations by the Office of Education for the year totaled 585 distributed over 64 different countries; and in addition

¹ Prepared for the printer before July 1, 1935, but delivered by the Government Printing Office during the fiscal year July 1, 1935-June 30, 1936.

reviews were made of 122 cases that were returned for further consideration. These evaluations are made by the Office at the request of colleges and universities in connection with their admissions.

Translations from 27 languages were made, totaling 174,610 words for the year, for the Office of Education alone and 6,495 words for eight other Government agencies.

LIBRARY SERVICE

More than 5,800 people visited the reading room of the Office of Education library and used 11,419 volumes which were brought from the stacks upon request, besides educational magazines and reference books in the reading room, of which no account was kept.

A special effort has been made to get the collection into shape to move into the new building, by eliminating duplicates among the unbound material, and completing and binding many files that had been accumulating as "incompletes" for a number of years. Much of this work has been done in the section of foreign education. The foreign ministries of education have been generous and helpful, and the library is grateful.

A bird's-eye view of the library's activities is shown in the following data: Books charged, 3,773; books brought to reading room, 11,419; theses loaned, 541; volumes sent to bindery, 752; telephone calls, 2,923; volumes cataloged and classified, 3,000; cards filed in catalog, 22,300.

7. ADMINISTRATION OF THE OFFICE

APPROPRIATIONS

For the fiscal year 1936 Congress appropriated for salaries in the Office of Education, exclusive of those for vocational education and rehabilitation, the sum of \$251,720, an increase of \$20,698 for that item for the fiscal year 1935. This increase provided for the restoration of salary reductions, an increase in the salary of the Commissioner, and for two additional positions—a specialist in State school administration and a stenographer. For the fiscal year 1937 the amount has been increased to \$262,980 and provides for the addition of a specialist in elementary education, a stenographer, two statistical clerks, and an amount of \$1,800 for the office of the Commissioner.

An amount of \$25,000 is appropriated for 1937 for a division of library service, which provides for the following additions to the staff: A chief of the division, two senior specialists, and four stenographers.

For general expenses an amount of \$15,000 was appropriated, and \$46,500 for printing and binding. For 1937 the appropriation for

general expenses was increased to \$20,000 to provide travel expenses for the collection of biennial statistics. The appropriation for printing and binding is in the same amount as for 1936.

HOWARD UNIVERSITY REPORT

Howard University was inspected during the year by the Office of Education, as required by law. The annual report was compiled for presentation to Congress. For this annual report the president of the university assembled data according to a plan approved by the Office. These data constitute both the report to the Secretary of the Interior by the president of the university and the report to the Congress by the Office of Education.

Inasmuch as the annual report of the president of the university to the Secretary of the Interior is included in the Annual Report of the Secretary, no details concerning the university are given here.

THE LAND-GRANT COLLEGES AND UNIVERSITIES

The 69 land-grant colleges and universities are located in every State of the Union and Alaska, Hawaii, and Puerto Rico; there are two in Massachusetts and in each of the 17 Southern States, one for white students and one for Negroes. The Federal endowment raised from the sale of land and land-scrip amounts to \$23,338,351 not including the value of 630,381 acres of unsold land estimated at \$5,124,046. These resources produced a revenue of \$1,315,430 for salaries of faculty members and facilities for instruction, for the year.

In addition to this endowment, annual appropriations (Morrill-Nelson funds) for the same year amounted to \$2,550,000 or \$50,000 to each State and the three Territories mentioned above. For the fiscal year 1935-36 this amount was increased by the passing of the Bankhead-Jones Act (June 29, 1935); section 22 of this act authorizes to be appropriated \$20,000 additional to each State and Hawaii, making a total of \$980,000 for 1935-36, and the sums will be increased by one-half a million dollars annually until 1938-39 when the appropriation will be \$2,480,000 annually, in addition to the Morrill-Nelson appropriations of \$2,550,000.

The Secretary of the Interior is charged with the certification and supervision of these funds, and the duty has been assigned to the Office of Education.

The land-grant institutions enroll 120,761 men and 54,056 women in residence instruction. Increased enrollments in agriculture were marked for the year being the largest in several years. More students than ever before were enrolled in veterinary medicine (1,459). Nearly twice as many students (2,455) were enrolled in forestry as

in the previous year. In home economics the number of girls enrolled has fallen off greatly since the depression, but improvements are being noted. In engineering, 28,755 students were registered representing an increase of 2,667 over the previous year. The depression has not affected the number of degrees granted to any considerable extent.

The total receipts for the year, from all sources reported by the 69 institutions amounted to \$139,946,185; these moneys were derived from student fees (\$19,036,769), endowment income (\$5,990,120), appropriations from Federal Government (\$22,325,384), State governments (\$57,225,632), district governments (\$1,942,433), private gifts (\$3,212,952), sales and services (\$7,826,629), auxiliary enterprises (\$17,686,305), and miscellaneous sources (\$4,699,961). Expenditures for educational and general purposes amounted to \$105,808,525; for noneducational expense, \$4,305,750; for auxiliary enterprises, \$16,786,148; and for capital outlays, \$8,244,990. Staff salaries totaled \$42,342,855 and all other wages \$27,689,608.

About \$424,000,000 represents the money invested in the land-grant institutions, including \$123,000,000 in endowment funds, \$275,000,000 in buildings, \$59,000,000 in grounds and \$100,805,000 in equipment.

III. VOCATIONAL EDUCATION

One of the major responsibilities of the United States Office of Education is administration of the Vocational Education Act of 1917 and the Vocational Rehabilitation Act of 1920. The former act provides for Federal-State cooperation in a program of vocational education in agriculture, trades and industries, and home economics; the latter, for similar cooperation in a program of vocational rehabilitation of persons disabled in industry or otherwise and their placement in wage-earning employment. The responsibility for administration of these acts was formerly vested in the Federal Board for Vocational Education, the functions and personnel of which were transferred to the Office of Education by Executive order in 1933.

This report covers the nineteenth year of Federal-State cooperation in vocational education and the sixteenth year of such cooperation in vocational rehabilitation, and the third year of the administration of these programs through the Office of Education.

In addition to these basic acts a number of supplementary acts have been passed from time to time authorizing appropriations of additional Federal moneys for vocational education and vocational rehabilitation programs. The vocational acts administered by the Office of Education at the present time, therefore, are as follows:

The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)

The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)

An act to provide for vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)

An act extending the benefits of the vocational education and vocational rehabilitation acts to the island of Puerto Rico. (Approved Mar. 3, 1931.)

An act (George-Ellzey) to provide for the further development of vocational education in the several States and Territories, authorizing for the years 1935-37 additional appropriations for vocational education. (Approved May 21, 1934.) This act continued authorizations of additional appropriations upon expiration of the George-Reed Act of February 5, 1929, which had authorized additional appropriations for the years 1930-34.

An act (Social Security Act) authorizing additional appropriations for 1936 and annually thereafter for cooperation with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled. (Approved Aug. 14, 1935.)

An act (George-Deen) to provide for the further development of vocational education in the several States and Territories, authorizing for the year 1937-38 and annually thereafter additional appropriations for vocational education. (Approved June 8, 1936.) This act continued authorizations of additional appropriations upon expiration of the George-Ellzey Act of May 21, 1934, which authorized additional appropriations for the years 1935-37, and authorizes appropriations for vocational education in the three fields—vocational agriculture, trades and industries, and home economics—and also in the distributive occupations, and for teacher training in each of these fields.

An act (Randolph-Sheppard) authorizing the operation of stands in Federal buildings by blind persons. (Approved June 30, 1936.)

COMPOSITION OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION

The National Vocational Education Act of 1917 provided for the creation of a Federal agency to be known as the Federal Board for Vocational Education, to cooperate with State boards in the promotion of public programs of vocational education of less than college grade, to be carried on in publicly supported and controlled educational systems. This board consists of four members *ex officio*: the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the United States Commissioner of Education; and three persons appointed by the President—one to represent agriculture, one to represent manufacturing and commerce, and one to represent labor.

When the functions of the Board were transferred to the Office of Education in 1933 the Board was made an advisory body, its

members serving without compensation. As at present constituted, the Board is made up of the following members:

Clarence Poe, of North Carolina, for the unexpired term of 3 years from July 17, 1934, succeeding W. Harry King, term expired (representing agricultural interests).

Paul H. Nystrom, of New York, succeeding Lincoln Filene, term expired for a term of 3 years from July 17, 1936 (representing commerce and manufacturing).

Henry Ohl, of Wisconsin, for the unexpired term of 3 years from July 17, 1935, succeeding Perry W. Reeves, term expired (representing labor).

DEVELOPMENT OF NATIONAL POLICY

Mention was made in the last annual report of the fact that Congress was giving consideration to legislation which would provide for a further increase in the Federal grants for vocational education. Such legislation was passed by the Seventy-fourth Congress in May 1936, and approved by the President June 8, 1936. This legislation—the George-Deen Act—provides for the further development of vocational education in the several States and Territories. It authorizes additional appropriations for the year 1937–38 and annually thereafter for vocational education in the fields of agriculture, trades and industries, and home economics, and for teacher training in these three fields. In addition it authorizes for the first time appropriations for vocational training in the distributive occupations as well as appropriations for training teachers in the distributive field; and extends Federal grants for vocational education to the District of Columbia. This act, which becomes operative July 1, 1937, supersedes the George-Ellzey Act, which expires June 30, 1937.

The passage of the George-Deen Act forecasts a new era of development in the field of vocational education. Taking cognizance of the difficulty experienced by many States in maintaining a budget sufficient to insure the uniform development and expansion of their vocational education programs, the act requires the States and Territories to match only 50 percent of the grants provided therein for the 5-year period ending June 30, 1942, this percentage being increased by 10 percent annually thereafter until it reaches 100 percent in the fiscal year 1947.

COOPERATIVE SERVICES TO THE STATES

Attention has already been directed to the fact that the programs of vocational education and vocational rehabilitation carried on under public control and supervision and reimbursed from Federal funds are operated under a Federal-State program of cooperation. Evidence of the effectiveness of these programs is to be found in their growth and development over a period of 19 years, in the case of

vocational education, and over a period of 16 years in the case of vocational rehabilitation.

Enrollment in vocational schools operated under State plans in agriculture, trade and industry, and home economics has increased from 164,123 in 1918 to 1,247,523 in 1935. Similar growth has taken place in the program of vocational rehabilitation. At the end of the first year of this program, June 30, 1921, the number of disabled persons rehabilitated and placed in self-supporting employment totaled 523, and the number on the rolls of the State in process of rehabilitation, 4,792. The number rehabilitated during the year ended June 30, 1935, totaled 9,422, and the number on the rolls in process of rehabilitation, 40,941. In all, 77,261 physically handicapped persons have been rehabilitated and placed in employment during the period, 1921 to 1935. These figures are the more significant when it is understood that rehabilitation must be done on a case and not on a mass basis, and that it takes from 1 to 4 years completely to rehabilitate a disabled man or woman.

Perhaps the most important function exercised by the Office of Education in the field of vocational education and vocational rehabilitation is its cooperative service to the States. In the field of vocational education this service consists of individual and group conferences with State and local administrative staffs; assisting in the development of State and local programs; organizing and conducting annual conferences of State administrators, supervisors, and teacher-training staffs in regional problems in the field of vocational education; assisting in research activities or surveys carried on by individual States in an effort to secure information or data which will aid them in planning, setting up, and operating an effective program of vocational education; teaching services in summer sessions for teacher trainers; and other special and miscellaneous services. Services of a similar nature are rendered also in the field of vocational rehabilitation.

Cooperative services to the States have covered the several fields of vocational education—agricultural, trade, and industry, home economics, and commercial education—and the field of vocational rehabilitation. A brief statement of some of the representative services rendered by members of the staff of the Office of Education in these fields follows:

In the field of vocational agriculture.—Special emphasis has been placed by the members of the Agricultural Education Service of the Office upon the setting up of part-time classes for out-of-school farm youth. To this end conferences have been held in most of the States with teachers and supervisors. As a result, more part-time classes were conducted during the year than ever before.

Particular attention has been directed, also, to the technical curricula in the several teacher-training institutions in agriculture, with the result that some of these institutions are now revising their programs with a view to making the curriculum less specialized and more nearly in line with the need of teachers for broad training in technical agriculture.

Three other services should be mentioned. These are: Assistance to State supervisors of vocational agriculture in developing evening classes for adult farmers in agricultural conservation, assistance to the States in so organizing their vocational-agriculture programs that some of the time of special workers may be allocated to the preparation of subject-matter materials for the use of teachers, and work with State officials in revising State record and report forms.

Cooperative service to the States in the field of vocational agriculture received new impetus during the year by a cooperative arrangement worked out between the Office of Education and the committee on policy and program appointed by the vice president of the American Vocational Association, representing agricultural education. At the invitation of the Commissioner of Education this committee met with staff members of the Agricultural Education Service of the Office in May 1936 for the purpose of formulating and interpreting policies to be used as a guide in building up a more complete and better coordinated program of vocational education in agriculture throughout the United States.

The report of this committee, which will form the basis for further discussion at the next meeting of the American Vocational Association, will be further revised and refined before it is published. It deals with the following problems:

1. Continuing education of teachers in service.
2. Maintaining sound relationships in administration.
3. Maintaining desirable working relationships with adult farm and related organizations.
4. Providing guidance and leadership for National, State, and local units of the Future Farmers of America organization, and for any other similar organizations of young farmers.
5. Increasing the services of the departments of vocational agriculture in the public schools by extending the program of adult education in vocational agriculture (evening school instruction).
6. Making systematic studies of problems in vocational agriculture.
7. Increasing the services of the public school to out-of-school farm youth.
8. Teaching present and prospective farmers techniques, and developing wholesome attitudes toward cooperation.

In the field of trade and industrial education.—Demands for help from the Office of Education in training programs for workers and prospective workers in trade and industry have increased materially

during the year. This has been due, in part at least, to a realization on the part of industrialists, brought about by conditions incident to the economic depression, of the need for trained supervisory and skilled personnel. The Trade and Industrial Education Service of the office has been called upon repeatedly for assistance in surveying and evaluating present programs of vocational education, to determine how well present needs are being met, and what adjustments should be made to improve these programs; and for help in training teachers, leaders, and coordinators in meeting specific problems confronting them in local situations.

Office of Education staff members have rendered considerable assistance to the States during the year in setting up programs of coordination of trade and industrial training under which adult workers are given adjustment training, and young workers are trained for placement in specific jobs. These coordination programs have resulted in a better understanding on the part of employers of the problems involved in training worker personnel and of the help they may receive in solving these problems through the vocational education program.

Local surveys covering the need of trade and industrial training were conducted in Charleston and Huntington, W. Va., in Chattanooga, Tenn., and in a number of other cities and localities. Special assistance in teacher-training activities was rendered by regional agents of the Office in a large number of teacher-training institutions. Successful diversified occupation training programs, under which youth are given part-time school instruction and practical experience through part-time employment in any one of a variety of occupations, were set up with the help of members of the Office of Education staff in several Southern States and elsewhere. A special conference of coordinators for such programs in Mississippi, South Carolina, Florida, and Arkansas was conducted by one staff member. Other activities to which special attention was directed by Office staff members include: Training programs in the field of arts and crafts; training courses for prospective and employed household workers; programs of itinerant instruction for small communities; foreman training conferences; analyses of the trade content of occupations in particular localities, to be used as a guide in setting up courses of study on these occupations; and apprentice training programs.

In the field of home economics education.—Among the services rendered by the Home Economics Education Service of the Office of Education, in addition to its regular advisory and consultative work, are the following: (1) Assisting 9 States in revising or readjusting curriculum programs in home economics; (2) making surveys of 8 teacher-training programs as a basis for improving the

preparation of teachers; (3) directing revisions in home economics curricula in 3 colleges; (4) planning and conducting a series of 3 district conferences of supervisors of home economics and representatives of teacher-training institutions for Negroes from 17 States at which the problems involved in the training of home economics teachers for colored schools were considered; (5) assisting with conferences for teachers of special groups, such as the children of foreign-born parents, called for the purpose of planning courses in home economics adapted to the home practices and circumstances of these groups; (6) conducting a conference of leaders in the field of home economics from all over the United States, called for the purpose of determining ways in which the Home Economics Education Service of the Office of Education can render service to general as well as vocational home economics.

In the field of commercial education.—Up to the present time no Federal grants have been available to the States for the reimbursement of vocational classes in any branch of commercial education as such. Under the Smith-Hughes Act, the Federal Board for Vocational Education, now the Vocational Education Division of the Office of Education, was authorized to make studies, investigations, and reports which would be of help to the States in the establishment of vocational schools and classes, and in giving instruction in commerce and commercial pursuits; and to cooperate with the States in the promotion of vocational commercial education classes established in general continuation schools, and in teacher-training classes established for the express purpose of training teachers of retail selling in such continuation schools. The George-Deen Act, which becomes operative July 1, 1937, authorizes Federal appropriations for vocational training in that branch of the commercial field known as the distributive occupations—occupations followed by those engaged in distributing goods produced on farms and in factories.

During the past year the services to the States of the Commercial Education Service of the Office have been confined to such activities as were consigned to it under the terms of the Smith-Hughes Act. More time has been devoted to aiding the States in the establishment of schools and classes for workers in distributive occupations, requests for which were received from State directors of vocational education, than to any other kind of special service. Most of these schools are supported by local taxes. In many instances it has been necessary, in getting these schools started, to enlist the cooperation of local trade associations with school authorities. For example, when it was decided to establish a class for retail meat shop apprentices in the Washburn School, Chicago, the combined support of the local meat cutters' union and local retail meat dealers' associations was enlisted

in the project, with excellent results. Similarly the support of organizations interested in food retailing in Philadelphia has been secured for contemplated classes for workers in food retailing establishments.

Considerable time was given also to assisting secondary schools in adjusting commercial courses and curriculums to conform to present-day conditions and requirements which face those who enter office employment as graduates of such courses. Many high schools have become keenly aware of the fact that comparatively few of their commercial graduates find employment in the kinds of office work for which the commercial courses are supposed to train them. Assistance was given the State of Maryland in an extensive revision of its curriculum for commercial courses in rural secondary schools. The Office also assisted curriculum revision committees in North Carolina in preparing a course of study in commercial subjects. In New Orleans a special commercial school for high-school graduates opened during the year, and is using a curriculum outlined in part by the Office of Education. In addition the Office recommended changes in the commercial courses in New Orleans high schools in general, designed to integrate the courses in these schools and the special commercial school. A former continuation school in Salem, Mass., which was during the year changed into a vocational high school for youth of high-school age, contains a commercial department organized as a vocational commercial preparatory school, conforming to recommendations set up by the Office of Education.

In the field of vocational rehabilitation.—Among the services which are rendered to the States by the Vocational Rehabilitation Service of the Office of Education from year to year are assistance in the following activities:

1. Training new personnel.
2. Organizing the keeping of case records.
3. Expansion of State services.
4. Organization and conduct of studies of special phases of rehabilitation service.
5. Development of cooperative relations with welfare and similar organizations.
6. General promotion of State programs of rehabilitation.
7. Expansion of cooperation by employees of State services.
8. Conduct of State staff conferences.

In addition to these services which were conducted during the year, the Rehabilitation Service of the Office has assisted in surveys of the rehabilitation programs in the States of Maryland, Oklahoma, Ohio, Indiana, Nebraska, and Colorado. These surveys cover such items as basic conditions affecting the program, plan of administration, and case service. Comprehensive reports of the findings from these surveys were prepared and submitted to the rehabilitation offi-

cials in each State covered. These reports were later discussed with the members of the State rehabilitation staffs, recommendations for the improvement of the services suggested by the surveys were discussed, and assistance was given in setting up plans whereby this improvement could be put into effect.

CONTRIBUTION TO RELIEF OF UNEMPLOYMENT

One of the primary purposes of vocational education, particularly during a period of depression, may be said to be the relief of unemployment. This objective is accomplished through the training of youth and adults to an employable status; through adjustment training for new occupations for workers whose occupations have been taken from them through technological changes and in other ways; and by improving the occupational efficiency of workers already employed, in order to enable them to hold their jobs.

A study of the young people who apply for jobs through the public employment agencies in various States shows that very few have ever received training for any kind of work. Not only are they unemployed but in many instances they are temporarily unemployable because they are totally untrained to do any of the jobs for which others are willing to pay. It is especially difficult in times of a surplus of workers for young persons to secure training on the job. Under such conditions the vocational school is the only source of such help for the untrained. Recognizing their special responsibility in this matter, therefore, vocational trade and industrial schools have, during the past several years, gathered in these untrained persons in all-day, part-time, and apprenticeship classes and have trained thousands of them for work. At the same time these schools have, through part time and evening schools, provided training for those already employed to enable them to keep abreast of new developments in their occupations and thus to retain their jobs.

Numerous examples might be cited to show the type of activities that have been carried on in the States in an effort to relieve unemployment through the medium of vocational-training programs.

Alabama reported in 1935 that 34,500 unemployed or otherwise distressed adults would likely be served through instruction programs carried on in cooperation with the State relief administration. An emergency program for homemakers carried on in 400 centers enrolled 8,900 individuals in 639 classes. In Birmingham evening and all-day schools were opened for any who could profit by the work. The schools there worked in close harmony with the local transient bureau and also with representatives of both employers and workers in this program. "All of this work in Birmingham", the report from that State reads, "has been done by vocational

classes subsidized by State and Federal funds allotted under the Smith-Hughes and George-Ellzey Acts."

Arizona reported that approximately 1,500 unemployed persons would be reached through itinerant classes in placer mining; that vocational agriculture officials there have cooperated with Federal transient camps in sponsoring garden and similar projects; and that the State supervisor of home economics has cooperated in organizing and carrying out emergency programs in homemaking and for nursery schools and in working out menus, recipes, and restricted diets for those on relief, using foods provided by relief agencies.

In Arkansas 112 classes, reimbursed from George-Ellzey funds, with an enrollment of 2,620, were organized, and 13 classes especially for unemployed women.

From Georgia came the report that "between 5,000 and 10,000 unemployed persons will likely be served by the program of vocational agriculture"; that "1,000 otherwise unemployed people have been trained for and placed in wage-earning jobs"; that "3,000 additional persons will be similarly cared for before the end of the year"; that "1,597 persons were given instruction in canning, 93,866 quarts of fruits and vegetables, 52,237 cans of meat, 168,318 pounds of pork having been thus preserved"; that "3,362 persons were given instruction in making 565 year-round gardens, with a total acreage of 672 acres"; that "1,389 persons were instructed in harvesting and storing farm food for the family and livestock"; and that "2,438 tons of food were harvested and stored."

In Florida "2,500 people will be definitely prepared for and assisted into employment through the division of trade and industrial education." Miami reports a hotel-training school for training "local citizens who would otherwise be unemployed and without means of support." Over 800 persons were thus trained and practically all of them were placed.

The record of these few States, selected at random, speaks for itself.

One of the chief causes of unemployment is technological change in processes and equipment, which frequently eliminates individual jobs or even entire trades. To retrain workers thrown out of employment as a result of such changes, is one of the specific purposes of vocational education. Such retraining may sometimes be accomplished by groups. More frequently, however, it must be accomplished on an individual basis. During the past 5 years a great many of the vocational schools of the country have been thrown open to unemployed adults where necessary training has been provided on an opportunity basis so that individuals might come at any time and receive training designed to help them secure and hold a job. During

the past year, indeed during the period of the depression, the Office of Education staff has cooperated with State supervisors and school administrators, relief agencies, the United States Employment Service, and other organizations in setting up training programs for youth and adults, and in finding placement where possible for those completing these courses.

The problem of unemployment as it applies to training in the field of home economics is a particularly difficult one. Those responsible for the vocational homemaking program have, however, done much to alleviate trying conditions brought about by reduced home incomes, and by other conditions incident to the depression. The homemaker has been taught how to use the money available for family expenses to better advantage in the purchase, preparation, and preservation of food; how to purchase, make use of, and remodel clothing; and how to safeguard family health. Members of the Office of Education staff have helped supervisors and teachers in setting up and operating programs of instruction designed to meet the needs of both those on low incomes and those on relief. Instruction to meet the needs, also, of wage-earning girls and women employed in household service who have been out of employment or employed for only part time, has been provided. Special classes in sewing have been set up in a number of centers for women employed in sewing work by the Works Progress Administration. Home economics teachers in rural communities have cooperated with teachers of vocational agriculture in an effort to broaden the scope of live-at-home programs, under which those in small towns or on farms are encouraged to raise and preserve as large a quantity as possible of the farm products, such as fruits, vegetables, and meats necessary to meet the food requirements of the family.

One of the principal objectives of the vocational agriculture program during the past 4 or 5 years has been the development of instruction designed to promote the agricultural adjustment of farmers and farm youth to conditions growing out of the depression, and to aid in rural rehabilitation and resettlement activities.

By reason of its primary objective—the physical restoration of disabled persons and their placement in remunerative employment—the vocational rehabilitation program administered by the Office of Education makes a distinct contribution to the relief of unemployment. Up to February 1, 1936, practically all the States received special grants from the Federal Emergency Relief Administration for the purpose of supplementing their regular programs. Through these grants the States were enabled to render special services to the disabled, which could not be rendered under the provisions of the Federal Rehabilitation Act. For example, these special funds were

used to provide artificial appliances for persons who could not continue in or be reestablished in employment without such appliances. Persons thus fitted for employment were kept off the relief rolls.

NEW PROBLEMS OF THE ALL-DAY AND PART-TIME VOCATIONAL SCHOOL PROGRAM

The later entrance of youth into industrial occupations in the past few years, brought about by legislation or changes in social or industrial conditions, has made it necessary to modify either the period of instruction in trade and industrial classes or the age of entrance into these classes. To this end it has been necessary either to lengthen the period of instruction by 1 year or more, or to raise the minimum age of entrance into vocational trade and industrial classes from 14 years to 15 or even 16 years. This is one of the problems which those responsible for trade and industrial education have had to meet during the year.

There is the other problem in the trade and industrial field, also—that of providing training for older youth, those from 18–25 years of age—and for adults, who while they were at work in a definite occupation were enrolled in part-time and evening classes, but who as unemployed persons may take advantage of day-school classes for training which will keep them abreast of new developments in their former occupations. These older youth and adults would not be interested in attending classes organized to give elementary training to young persons who are still in full-time school. All-day vocational schools have therefore been modifying and developing their programs not only to meet the needs of youth needing preparatory training for work, but to provide special part-time instruction to meet the needs of older youth and adults, already employed or previously employed.

A problem to which vocational agriculture schools have had to give attention is that of training for out-of-school youth, who thrown out of employment in the cities have returned to the farm. These youth are usually not interested in all-day classes, but rather in short intensive courses in specific phases of training which must be given in part-time classes.

Still another group—city youth and adults who having lost their regular jobs have come to the country for the first time to try to make a living in farming—needs instruction in farming. For this group part-time and evening instruction in special branches of agriculture has been made available in localities in which vocational agriculture schools are located.

In setting up classes for the out-of-school youth who are working on home farms or other farms, attention is given to instruction which

will further prepare them for successful farming. In some instances these youth have accumulated a little money in connection with supervised farm-practice projects while attending day-school classes in vocational agriculture and are looking forward to entering farming "on their own." What they need and desire, therefore, is continued training which will enable them to improve their farm management and to advance toward the goal of farm ownership. In addition to setting up training units for these youth those responsible for the program of vocational agriculture have made a definite effort to see that they are placed on farms. To this end they have sought the cooperation of land banks and other financial institutions and farm owners in working out a plan whereby these boys may purchase farms suitable for the agricultural enterprises in which they desire to engage. Such youth are encouraged, after they are settled on farms, to continue their training in evening classes in vocational agriculture in order that they may advance as rapidly as possible in their chosen field. Many of these youth, also, are earning additional money through the supervised farm practices required of them in connection with their vocational agriculture courses.

The principal problem so far as the adult farmer is concerned has been to provide evening-class instruction which would enable him to better adjust his farm-management plans to meet changing conditions.

Certain definite changes have taken place in respect to all-day and part-time classes in the field of commercial education. There has, for instance, been a decrease in enrollment in commercial classes in part-time general continuation schools, resulting from decreased employment in offices and stores, of youth under 18 years of age. Decrease in employment of youth under 18 in stores, for almost every kind of work, has resulted in a corresponding decrease in enrollment in cooperative retail selling classes. Cooperative retail selling classes have been practically closed in many cities. Changes in demand for workers may make continuance of high-school retail selling classes almost impossible, especially in cities where most of the high-school graduates are not mature enough to be satisfactory salespeople or store-service workers.

APPRENTICE TRAINING

Reports from the States show that the promotion of apprentice training is recognized as a major responsibility of State boards for vocational training in developing the Federal-State programs of vocational education.

This form of vocational training was recognized by the Commission on National Aid for Vocational Education, appointed by President Wilson, which in its report in 1914 declared that "vocational educa-

tion is needed to provide a supplement to apprenticeship." The Commission's recommendations on this subject were incorporated into the Smith-Hughes Act, and apprentice training has been a definite part of the vocational-education program ever since it was started in 1917.

During the year members of the Office of Education staff have cooperated with the Federal Committee on Apprentice Training in helping the States set up State advisory committees for apprentice training and in working with interested groups throughout the country in establishing improved standards in the field of apprentice education. Working with such advisory committees, vocational schools are maintaining trade instruction for thousands of apprentices through evening and part-time classes.

Chicago, Milwaukee, Detroit, Seattle, Portland, San Francisco, Denver, San Antonio, Houston, New Orleans, Pittsburgh, New York, Wilmington, Cleveland, and Boston are among the cities in which vocational schools are cooperating with other interested agencies in the promotion of apprentice training. In all cases the courses are organized with the advance and assistance of workers and employers from the special trades and occupations in which the apprentices are employed.

The States of Pennsylvania, New York, Massachusetts, and Connecticut have increased their enrollment in apprentice classes during the past year. In Pennsylvania a full-time coordinator has been employed to have full charge of apprentice programs.

OCCUPATIONAL ADJUSTMENT TRAINING

Occupational adjustment training—training to adjust workers to changes in industrial processes, techniques, and materials, in their trades or occupations—was recognized by Congress when it passed the National Vocational Education Act. Occupational adjustment training, intended as it is for workers already employed, must by its very nature be provided largely in evening classes. The Smith-Hughes Act makes specific provision for such classes.

Increased opportunities for employment following the prolonged period of depression served to emphasize the need for occupational adjustment training for those already employed to enable them to take new jobs which become available in their occupations. It has served to emphasize further the need for training on the part of workers in older age groups who in order to hold their jobs must keep themselves up to date in the new technics. It has been necessary also to train for new jobs workers whose former occupations have been eliminated by reason of technological and other changes.

The vocational schools have made it possible for hundreds of workers to learn to handle new tools and new material and to learn new processes and thus to resume work on their old jobs. Plumbers and boilermakers have learned to do welding; sheet-metal workers, electricians, and steam fitters have been trained to install, operate, and service air-conditioning plants; auto mechanics have learned how to operate and maintain Diesel engines; and electrical workers have been taught to service radio, electric refrigerators, and vacuum cleaners. These are but a few of the examples of adjustment training by which thousands of workers, thrown out of their former jobs through changing conditions, have been fitted for employment in new occupations.

Instruction in home economics in evening classes for adults has centered attention upon adjustments in the practices of homemakers with respect to the expenditure of reduced incomes for food, clothes, home furnishings, and other home necessities; upon the preservation of food, especially that raised in home gardens; and upon measures designed to create better health and sanitation conditions in the home. Such instruction may be said to be occupational adjustment instruction.

For evidence of the scope and effectiveness of instruction in occupational adjustment in agriculture, trade and industry, and home economics, it is necessary only to point to the enrollment of adults in vocational classes operated under State plans in these fields during the year. The total enrollment in such classes was approximately 411,000, of which 110,000 were farmers seeking instruction which would aid them in revising their farm-management practices in line with new developments—scientific and economic—in agriculture; 164,000 were trade and industrial workers, learning the new techniques in their trades; and 136,000 were women, many of them forced by circumstances to practice rigid economies, enrolled to secure instruction which would be an asset to them in their efforts to provide the maximum of satisfaction, comfort, and happiness for their families. These enrollment figures are in contrast to those for the previous year, when 370,000 persons were enrolled in evening schools—101,000 farmers, 140,000 trade and industrial workers, and 129,000 homemakers.

COOPERATION WITH OTHER AGENCIES

It would be impossible for the Office of Education as the Federal administrative agency under the National Vocational Education and National Vocational Rehabilitation Acts, or for State boards for vocational education and vocational rehabilitation to carry on effective

programs in these two fields without cooperating with other agencies more or less concerned with these fields.

Vital as this cooperation is under normal conditions, it is doubly essential under the economic and social conditions which have obtained in the past 6 years. Both Federal and State authorities responsible for the promotion of vocational education and vocational-rehabilitation programs have realized the necessity for a well-planned cooperative effort.

During the past year the Office of Education, continuing a policy adopted with the inception of the vocational-education program in 1917, has worked in close touch with other Government agencies and other public and private agencies whose objectives dovetail with those of the vocational-education program.

The trade and industrial service of the Office has cooperated with the Federal Committee on Apprenticeship Training in promotional work in the field. Two members of the staff of this service have continued to serve as members of this committee. Another member of the service has worked with the United States Air Corps in making an analysis of occupations in the field of communications. The service cooperated with the Department of Labor in preparing and publishing a summary of State laws covering school attendance and employment of minors. Assistance was given the Home Owners' Loan Corporation in organizing a plan of training for groups of its field workers. Various services were rendered by the trade and industrial service also to the Civilian Conservation Corps, the Public Works Administration, the United States Forest Service, the National Youth Administration, and the Tennessee Valley Authority. Other public and private agencies with whom the trade and industrial service has cooperated during the year include: American Municipal Association, American Management Association, a number of industries, and various national labor organizations.

During the year a considerable portion of the time of staff members of the agricultural service of the Office, of State supervisory and teacher-training departments, and of local teachers of vocational agriculture has been devoted to the development of further and closer cooperative working relationships with Federal, State, and local agencies in the field of agriculture, unemployment relief, and emergency education. The service has cooperated with the Farm Credit Administration in carrying to State supervisors and teacher trainers in agricultural education, and in turn to individual farmers, information concerning the activities of that Administration and the services it makes available to farmers in financing their operations. Vocational agriculture teachers have assisted farmers and farm youth enrolled in vocational agriculture classes to get production credit

loans and loans from Federal land banks to refinance their farm mortgages. Farm youth have secured loans in connection with their supervised practice programs. The agricultural service of the Office has also cooperated with teacher trainers employed by the Agricultural Adjustment Administration in the development of teaching information to be used by vocational agriculture teachers in explaining to their classes the purposes and activities of the soil-conservation program. Teachers of agriculture continue to cooperate with camp educational advisers of the Civilian Conservation Corps by assisting them in organizing teaching materials in agriculture to be used in camp classes and by extending the facilities of vocational agriculture departments for inspectional and field trip purposes. Many State supervisors of agricultural education are cooperating with State organizations responsible for the administration of Federal emergency education programs, and in some instances these supervisors have shouldered a considerable share of the responsibility of administering these programs. As explained in the discussion on day-school and part-time classes, the agricultural service is working with land banks and other financial institutions in getting vocational agriculture students placed on farms as renters or as owners.

The home economics education service has cooperated during the year with five Government agencies. It is conducting a study in cooperation with the Home Economics Extension Service of the Department of Agriculture, designed to assist in the development of type programs of vocational home economics education. A series of lessons was prepared by the Office of Education for the educational director of the Home Owners' Loan Corporation, on the household budgets. Help was given the women's work division of the Federal Emergency Relief Administration in planning a program of household employment. Assistance was rendered in various ways also to the Rural Electrification Administration and the Resettlement Administration.

Throughout the year interrelations between agencies vitally concerned with the welfare of disabled persons have been materially strengthened through the cooperation of the vocational rehabilitation service of the Office of Education and the State rehabilitation services. This cooperative effort has extended to such organizations as workmen's compensation bureaus, State employment offices, and crippled children's agencies. The rehabilitation service of the Office has been giving attention also to the establishment of organized working relations between State rehabilitation departments and county or local public agencies.

RESEARCH AND PUBLICATIONS

A continuing program of research has been carried on by all services of the vocational education division of the Office of Education during the year.

The agricultural education service is assisting in a research organized under a committee of the National Association of State Directors of Vocational Education, covering the amount and distribution of time devoted to vocational agriculture in high schools. This service is making a study, also, which has for its objective the evaluation of supervised farm practice in vocational agriculture departments in the Southern States. Two other studies—one on the status and farming record of graduates of vocational agriculture courses, and the other on the place of vocational agriculture in the small high school—have been under way during the year. Other studies on which research is being made by the agricultural education service are: The out-of-school farm youth; placement opportunities for vocational agriculture graduates; and the use of agricultural experiment station data in vocational agriculture classes. The service is cooperating in the University Research project, which provides for the cooperation of colleges and universities in studies and investigations in agricultural education, in which the services of unemployed relief workers are utilized. The research specialist of the agricultural education service is serving as a member of the Committee on Research, Agricultural Section, American Vocational Association. During the year, also, he was called upon to assist graduate students attending summer sessions in several universities with their research problems, through individual and group conferences.

A study of aviation courses in the public schools, started by the trade and industrial service over a year ago, was completed during the year. A second study—training for sheet-metal workers in the aviation industry—is rapidly being completed. Other studies under way in this service are: Vocational needs in the District of Columbia; safety plans in public school shops; apprentice training; household training courses; vocational education for adults; and fireside or handicraft occupations, particularly in New England and the Southern States.

Four studies have been conducted by the home economics service: One on out-of-school rural girls; one on the extensiveness of home economics in public schools in States and Territories; one on the field of home management; and a study, undertaken in cooperation with the home economics extension staff of the Department of Agriculture, on the needs and services available in home economics education in Garrett County, Md. The special agent for studies and investigations of the home economics service has assisted in guiding the program

of a committee on graduate study in the central region States, and has given assistance in research to groups in other regions. She has also advised with graduate students on studies in the field of home economics.

The Commercial Education Service completed during the year a study of cooperative training in retail selling in public high schools. Statistical studies covering changes in commercial occupations have been continued.

In addition to completing surveys of rehabilitation programs in seven States, as indicated under the discussion of "Cooperative Services to the States", the vocational rehabilitation service of the Office completed a study of procedures for such surveys, the results of which were prepared for publication in bulletin form. Results of a second study—factors in the rehabilitation of more than 10,000 persons returned to remunerative employment in 1935—were compiled and put in form for publication.

The principal publications issued by the Vocational Education Division during the year, in addition to the detailed reports of regional conferences of vocational education workers in the three fields—agriculture, trade and industry, and home economics—are as follows:

GENERAL

Misc. 1766. Digest of annual reports of State boards for Vocational education to the Office of Education, Division of Vocational Education, for the year ended June 30, 1935.

Misc. 1726. Hobbies. A bibliography.

AGRICULTURAL EDUCATION

Bulletin No. 183. Business problems in farming. Suggestions to teachers of vocational agriculture for use in conducting agricultural evening classes.

Bulletin No. 188. Young men in farming. Individual case studies of young men to determine their qualifications, opportunities, and training needs for the vocation of farming.

TRADE AND INDUSTRIAL EDUCATION

C. L. 1871. Minutes of meeting of Advisory Committee of Nine.

C. L. 1861. New definitions and interpretations affecting trade and industrial education.

C. L. 1880. Conditions for training programs within industrial plants.

C. L. 1896. Use of new forms for annual statistical reports.

Misc. 1526. State compulsory school attendance standards affecting the employment of minors.

Summary on apprenticeship in 1935.

Set of 8 charts on "Occupational Statistics in the United States."

HOME ECONOMICS EDUCATION

Bulletin No. 181. Space and equipment for homemaking instruction.

Bulletin No. 182. Consumer buying in the educational program for homemaking.

Bulletin No. 187. Home-economics education courses. A study of practices in teacher-training institutions reimbursed from Federal funds for vocational education.

Misc. 1163. Studies and research in home-economics education reported by colleges and universities. Revised.

Misc. 1173. Subject index to theses studies in home-economics education. Revised.

Misc. 1717. An educational program for household employment.

Misc. 1809. Homemaking education programs for adults and out-of-school youth.

Misc. 1810. Illustrations of student-teaching programs in home economics.

VOCATIONAL REHABILITATION

Bulletin No. 184. Procedure for survey of a State program of vocational rehabilitation. A manual of procedure for assembling and interpreting data on the factors involved in the conduct of a State rehabilitation program.

Bulletin No. 120. Vocational rehabilitation in the United States. The evolution, scope, organization, and administration of the program of vocational rehabilitation of disabled persons. Revised.

Misc. 1774. Vocational rehabilitation: Restoration of physically handicapped persons to useful employment.

Statistical tables of cases rehabilitated, fiscal year 1934-35.

APPROPRIATIONS: 1936 AND 1937

Appropriations under the several vocational education and vocational rehabilitation acts for 1936 and 1937, for research and service to aid the States and for administration of the acts, are shown in table 1; totals of appropriations to the States and Territories under these acts in table 2; and allotments to the States and Territories in table 3.

Appropriations for research, service, and administration under the Smith-Hughes Act have been continued in the same amount for 1937 as for 1936. Appropriations under the George-Ellzey Act have been slightly increased for 1937. Appropriations under the Rehabilitation Act as amended by the Social Security Act have been increased for 1937.

TABLE 1.—*Appropriations for research and service to aid the States and for administration: 1936, 1937*

Act	1936	1937
Smith-Hughes Act.....	\$192,000	\$192,000
George-Ellzey Act.....	64,000	73,000
Rehabilitation Act.....	63,500	74,420

Appropriations for allotment to the States and Territories under the Smith-Hughes and George-Ellzey Acts have been continued in the same amounts for 1937 as for 1936. Appropriations to the States under the Rehabilitation Act as amended by the Social Security Act

were increased by \$350,000 for the last 5 months of 1936, and have been approximately doubled for 1937. Additional appropriations for vocational rehabilitation to Hawaii and Puerto Rico have been provided for 1937, and the appropriation to the District of Columbia has been continued in 1937 as for 1936.

TABLE 2.—*Appropriations for allotment to the States and Territories for vocational education and vocational rehabilitation: 1936, 1937*

Act	Appropriation	
	1936	1937
VOCATIONAL EDUCATION		
Smith-Hughes Act		
Total.....	\$7, 167, 000. 00	\$7, 167, 000. 00
Vocational agriculture.....	3, 027, 000. 00	3, 027, 000. 00
Vocational trade, industry, and home economics.....	3, 050, 000. 00	3, 050, 000. 00
Vocational teacher training.....	1, 090, 000. 00	1, 090, 000. 00
George-Ellzey Act		
Total.....	3, 084, 603. 00	3, 084, 603. 00
Vocational agriculture.....	1, 031, 019. 75	1, 031, 019. 75
Vocational trade and industry.....	1, 032, 191. 60	1, 032, 191. 60
Vocational home economics.....	1, 021, 391. 65	1, 021, 391. 65
Hawaii.....	30, 000. 00	30, 000. 00
Puerto Rico.....	105, 000. 00	105, 000. 00
VOCATIONAL REHABILITATION		
Vocational Rehabilitation Act.....	1, 097, 000. 00	1, 938, 000. 00
Supplemental Appropriations Act.....	350, 000. 00	
Hawaii.....		5, 000. 00
Puerto Rico.....		15, 000. 00
District of Columbia.....	15, 000. 00	15, 000. 00

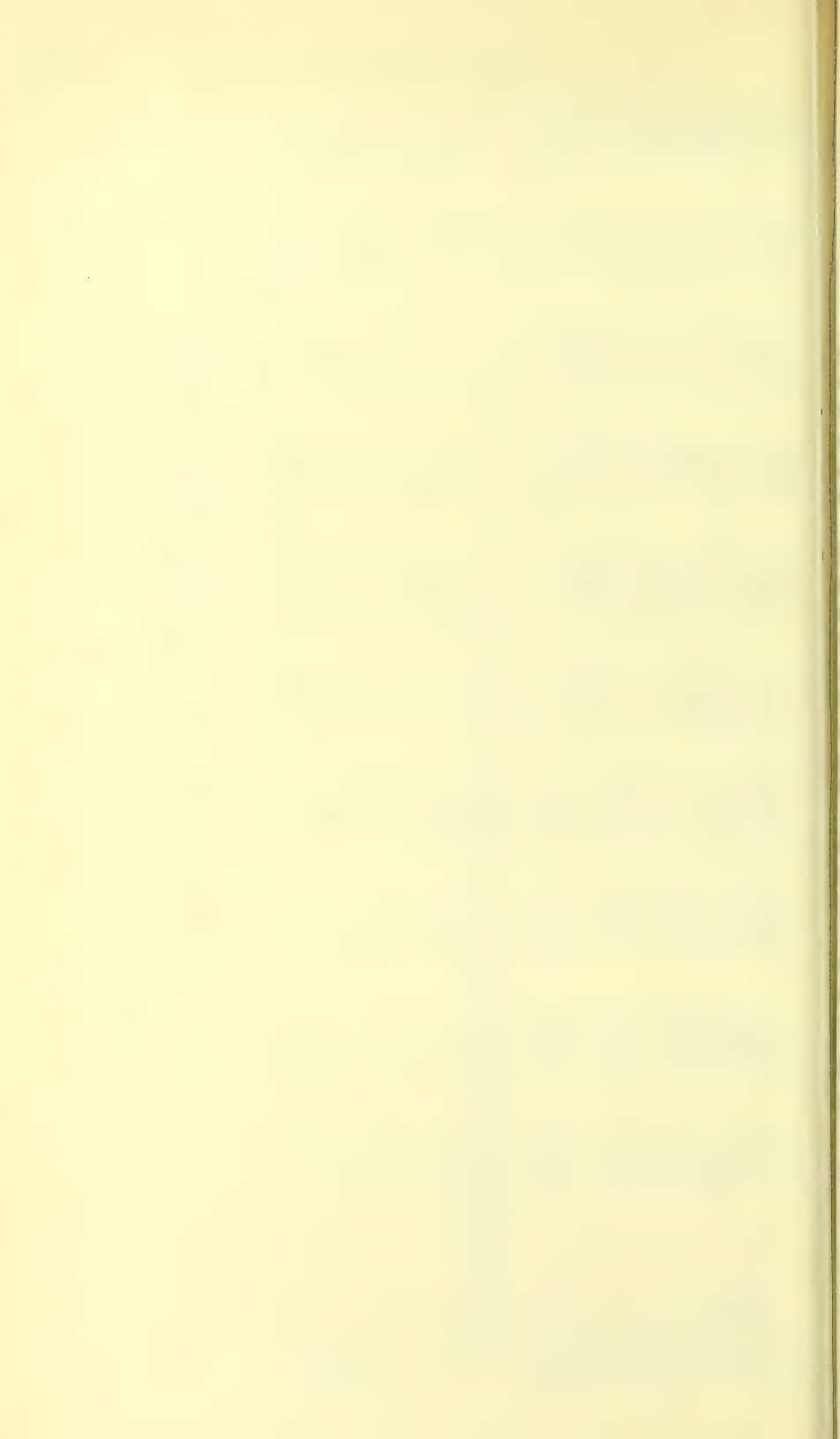
Pennsylvania.....	537,709.58	172,677.04	286,273.09	78,759.45	180,579.47	27,970.81	95,285.92	57,322.74	106,161.44	144,602.35
Rhode Island.....	47,842.03	10,000.00	27,842.03	10,000.00	17,286.75	5,000.00	7,286.75	5,000.00	11,955.99	10,321.88
South Carolina.....	106,714.19	78,236.31	16,259.29	14,218.59	64,159.77	29,922.51	8,923.47	23,307.79	19,165.52	26,105.33
South Dakota.....	51,323.28	31,323.28	10,000.00	10,000.00	28,138.31	12,740.08	5,000.00	10,398.23	10,402.24	10,402.24
Tennessee.....	136,355.22	93,875.76	39,282.82	21,396.64	86,726.44	39,684.15	15,214.90	31,827.39	28,840.96	39,284.23
Texas.....	343,814.26	191,491.24	104,691.96	47,631.06	178,077.40	76,800.99	37,708.02	63,588.39	64,202.86	87,450.62
Utah.....	35,132.76	13,466.11	11,666.65	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	11,444.87	10,000.00
Vermont.....	33,424.97	13,424.97	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	11,023.12	10,000.00
Virginia.....	145,433.63	91,209.99	34,419.18	19,804.46	77,295.40	31,041.94	15,974.93	30,278.53	26,694.83	36,360.99
Washington.....	89,381.85	37,840.26	38,757.07	12,784.52	36,179.26	9,949.57	13,668.05	12,561.64	17,232.51	23,472.38
West Virginia.....	104,667.06	68,990.85	21,535.80	14,140.41	51,466.68	14,663.44	13,900.79	22,902.55	19,060.14	25,961.79
Wisconsin.....	169,327.36	77,210.55	68,083.37	24,033.44	76,745.11	28,766.16	22,347.75	25,631.20	32,395.16	44,125.40
Wyoming.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	10,641.75	10,000.00
Alaska.....										
Hawaii.....	30,000.00	10,000.00	10,000.00	10,000.00	15,000.00	5,000.00	5,000.00	5,000.00	2,080.00	10,000.00
Puerto Rico.....	105,000.00	30,000.00	460,000.00	13,000.00	15,870.52	5,870.52	5,000.00	5,000.00		15,000.00

¹ The allotments under the Vocational Rehabilitation Act include allotments under both the organic act and the Social Security Act.

² The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

³ A special allotment of \$5,000 to Hawaii and the allotment to Puerto Rico are not included in the total under the Rehabilitation Act.

⁴ Trade and industrial education, \$30,000; home economics education, \$30,000.



GENERAL EDUCATION BOARD

(L. M. DASHIELL, *Treasurer*)

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

On June 30, 1936, principal fund, belonging without restriction to the Board, amounted to \$34,734,598.42. This fund is invested in stocks and bonds. In addition the sum of \$13,865,481.91 is reserved to pay appropriations to various educational institutions, and the further sum of \$3,495,000 has been referred to the executive committee for appropriation, a total sum reserved of \$17,360,481.91. This fund is invested as follows: Securities, \$14,324,801.45; and cash on deposit, \$3,035,680.46. Lapses and refunds on prior years' appropriations amounted to \$50,000 and \$207.92, respectively. The sum of \$3,918,220.30 was paid during the year ended June 30, 1936.

Appropriations from income during the year aggregated \$3,253,608.31. Lapses on account of prior years' appropriations amounted to \$78,593.54, however, leaving a net increase in income appropriations of \$3,175,014.77.

The income from the above funds, together with income from undisbursed income (and including the sum of \$134.20 received on account of income from the estate of Lucy M. Spelman) amounted during the year to \$2,648,893.75; the balance of income from the previous year as of June 30, 1935, amounted to \$10,260,615.49, which, together with sundry refunds amounting to \$9,211.17, increased the total to \$12,918,720.41.

Disbursements from income during the year were as follows:

Whites:

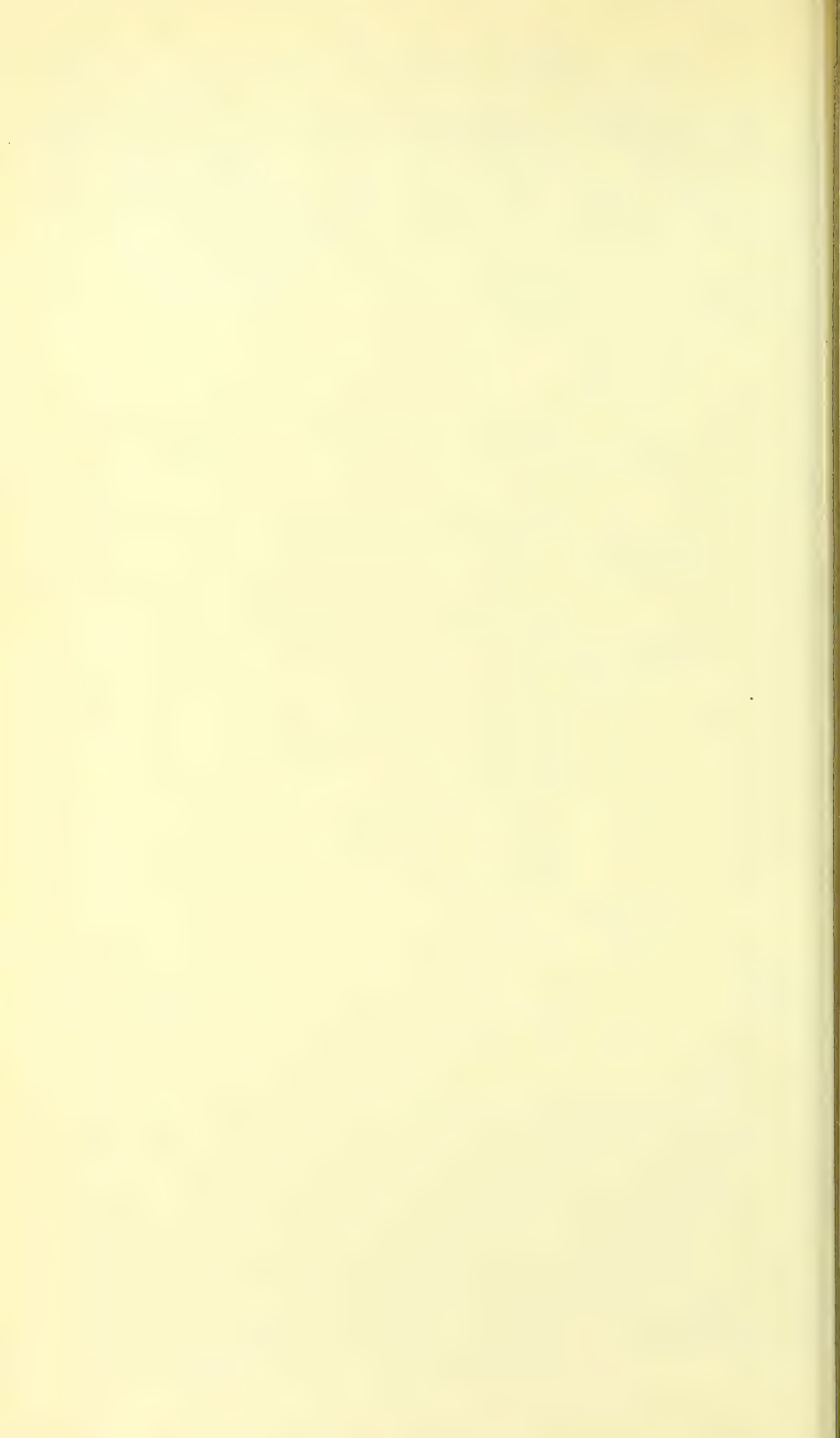
Colleges of Liberal Arts: General endowment,	
buildings, and other purposes-----	\$805, 228. 42
Science of education:	
Schools of education-----	\$30, 705. 21
Special projects-----	167, 326. 24
	<hr/>
	198, 031. 45
Natural sciences-----	12, 608. 18
Medical sciences: Schools of medicine-----	71, 000. 00

Humanities.....	\$237, 956. 45	
Humanities.....	237, 956. 45	
Public education:		
Fellowships.....	\$41, 899. 33	
Special divisions in State de-		
partments of education.....	80, 192. 53	
Teacher training.....	37, 516. 65	
Library training.....	29, 800. 00	
Studies.....	22, 437. 34	
Other purposes.....	4, 703. 09	
		216, 548. 94
Miscellaneous.....		212, 382. 04
General education.....		714, 663. 87
Child growth and development.....		196, 212. 48
Training of personnel for the advancement of		
knowledge.....	196, 180. 64	
		\$2, 860, 812. 47
Negroes:		
Colleges and schools: General endowment,		
buildings, and other purposes.....	600, 831. 08	
Social sciences.....	10, 000. 00	
Medical sciences:		
Schools of medicine.....	\$172, 500. 00	
Special projects.....	2, 475. 00	
		174, 975. 00
Public education:		
Summer schools.....	9, 801. 55	
Anna T. Jeanes foundation....	25, 000. 00	
John F. Slater fund.....	30, 000. 00	
Rural-school agents.....	121, 421. 04	
Fellowships.....	66, 682. 09	
Special divisions in State de-		
partments of education.....	750. 00	
Teacher training.....	1, 250. 00	
Other purposes.....	166. 48	
		255, 071. 13
Miscellaneous.....		1, 753. 11
		1, 042, 630. 32
Surveys and studies.....		18, 365. 87
Miscellaneous projects.....		4, 655. 63
Administration.....		303, 789. 07
		4, 230, 253. 36

This leaves an undisbursed balance of income on June 30, 1936, of \$8,688,467.05, which is invested as follows: Cash on deposit, \$8,221,635.63, and accounts receivable, net, \$466,831.42. It should be noted, however, that against this balance of \$8,688,467.05 there are unpaid appropriations amounting to \$8,122,261.71, leaving unappropriated income amounting to \$566,205.34.

The Anna T. Jeanes fund, the principal and interest of which are to be used for Negro rural schools, amounted, on June 30, 1936, to \$40,919.21. This sum is in cash on deposit. The sum of \$25,000 was appropriated and paid during the year.

The income from this fund during the year was \$1,937.68. Added to the balance from previous year of \$5,304.77, the total available income amounted to \$7,242.45. The sum of \$3,157.96 was paid, and a payment of \$1,750 under prior years' appropriation originally charged to principal, was transferred to income, leaving \$2,334.49, which is accounted for in cash on deposit. Of this balance of \$2,334.49, there were unpaid appropriations of \$1,985.99, leaving \$348.50 available for appropriation.



GENERAL LAND OFFICE

(FRED W. JOHNSON, *Commissioner*)

Due to Executive orders of withdrawal, no. 6910 of November 26, 1934, and no. 6964 of February 5, 1935, and the amendments thereto, there was a marked decrease in the number of acres included in original entries, selections and filings made during the year, when compared with the previous year. The area was 425,834 acres, as against 1,759,078 acres which were included in such appropriations during the preceding year.

The area embraced in final entries, selections and filings made during the year was 1,937,526 acres, an increase of 165,823 acres over the area included in such entries during the preceding year.

Altogether 8,238 patents were issued for 2,216,684 acres, while during the preceding year only 6,102 patents were issued for 1,394,130 acres. This shows an increase of nearly 60 percent over the area patented during the year 1935. In addition, under State grants, 253,903 acres were certified to States, an increase of 30,602 acres over the area so certified during the previous year.

The area which on June 30, 1936, was embraced in unperfected entries upon which final proof of compliance with the law was not due or had not been presented, was 16,862,271 acres, or 2,804,442 acres less than were included in such entries on June 30, 1935. The area which on June 30, 1936, was included in outstanding licenses, leases, and permits issued under the mineral leasing act was 12,322,637 acres, an increase of 1,014,960 acres over the number of acres under such form of appropriation at the close of the preceding fiscal year.

There were furnished during the year 36,898 certified and uncertified copies of entry papers, plats, field notes, patents, etc., for which there were received amounts aggregating \$10,826.75. In addition there were furnished for official use by this and other departments and agencies 60,016 copies of said items. There were furnished altogether 6,468 more copies than were supplied during the preceding year.

Reports were submitted on 69 Senate and House bills, and necessary orders and instructions have been prepared or are in course of preparation in connection with 67 bills, public and private, affecting the public lands which were enacted into law. Reports were made on 26 enrolled bills.

In connection with pending and proposed suits 211 letters were written, which related to initial or interlocutory actions, commented on bills of complaint, and considered reorganization plans of the defendant companies under the Bankruptcy Act. Twelve suits were recommended.

Favorable consideration was given to 75 applications to practice before the Department and charges made in 2 cases against United States commissioners were sustained and the revocation of their respective appointments was recommended.

The number of letters and reports received for consideration or answer from all sources during the year was 139,147, and 73,956 letters and decisions were written. The latter figure does not include letters prepared for signature in the Department.

There were decided on principles of equity, and referred to the Board of Equitable Adjudication and confirmed, approximately 1,553 cases.

Numerous requests were received during the year from other bureaus and departments in connection with their respective operations for the status of public lands, the compilation of maps or diagrams, certified copies of records, the preparation or consideration of proposed orders of withdrawal or restoration, or other information or action. This work frequently involved much research or consideration and it added considerably to the duties of the office.

In land exchanges made for the benefit of other bureaus this office examined abstracts of title covering many thousands of acres in order to determine the sufficiency of title to the lands offered as base. The facts as to such exchanges will be set forth hereinafter in detail.

TAYLOR GRAZING ACT

Grazing districts.—This office, in cooperation with the Division of Grazing, and in accordance with departmental order of March 11, 1935, has prepared the orders which have been issued establishing grazing districts and describing the lands included within the exterior boundaries thereof, together with the diagrams accompanying the orders, showing the exterior boundaries of each grazing district, and other pertinent data. It is estimated that the total area included in all established districts, as of June 30, 1936, was 79,805,186 acres.

Amendment to act.—The act of June 26, 1936, Public, No. 827, amended the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), so as to increase the area subject to inclusion in grazing districts from 80,000,000 to 142,000,000 acres. The amendatory act modifies sections 7, 8, 10, and 15 of the act, and it adds a new section thereto, namely, section 17, which relates to personnel of the Division of Grazing. The

administration of sections 7, 8, 10, and 15 rests largely with the General Land Office.

SEC. 7. *Homestead and other entries.*—Section 7 of the Taylor Grazing Act, as amended, authorizes the Secretary of the Interior, in his discretion, to examine and classify any lands withdrawn or reserved by Executive Order No. 6910, of November 26, 1934, and the amendments thereto, or by Executive Order No. 6964, of February 5, 1935, as amended, or within a grazing district, and to make such lands subject to disposal under any applicable public land law, when such classification shows that the lands are more valuable or suitable for such use than for the use provided for by said act, or that the lands are proper for acquisition in satisfaction of outstanding lieu, exchange, scrip, or land-grant rights. However, no homestead entry may be allowed for more than 320 acres. Classification may be made by the Secretary of the Interior on his own motion, or on application.

A few requests were received under the original section 7 to have lands classified and opened to homestead entry, which requests were referred to the Division of Grazing, as required by Circular No. 1353. No such classifications have yet been made.

SEC. 8. *Exchange of lands.*—The limitation imposed by section 8 of the original act, that exchanges of privately owned lands may be made only when such lands are situated within the boundaries of a grazing district, has been removed by the amended act. Under the act as amended, exchanges may be made of privately owned lands situated outside of grazing districts, as well as of such lands situated within grazing districts. This liberalization of the law will permit private holdings outside of grazing districts to be blocked up in the public interests for grazing use.

The authorization for the exchange of State-owned lands has also been materially modified. Such exchanges may now be made acre for acre as well as on the basis of equal value. Exchanges of State land may not, however, involve the selection of public lands within a grazing district unless the base or offered lands are also within such district, and then only when the selected lands lie in a reasonably compact body, so located as not to interfere with the administration or value of the remaining lands in such district for grazing purposes.

A total of 19 applications for the exchange of privately owned lands were filed during the year, of which 2 were rejected, leaving 17 cases pending. The pending cases are awaiting reports from the Division of Grazing.

At the beginning of the year there were 202 applications pending for the exchange of State lands. Fifty-nine new applications were received and 59 applications were finally rejected. Action on 130 applications was suspended for various reasons. Reports from the

Director of Grazing were requested on 29 applications, and from the Division of Investigation in 26 cases. Additional evidence was required, or other action taken, in 40 cases.

SEC. 10. *Disposition of proceeds.*—The amended law brings all moneys received from the administration thereof, except as provided by sections 9 and 11, under the plan of distribution under which 25 percent thereof, when appropriated by Congress, may be used for the construction, purchase, or maintenance of range improvements and 50 percent will be paid to the States for the benefit of the county or counties in which the lands producing such moneys are situated. This distribution includes the receipts from leases under section 15 of the act, which receipts were not subject to such distribution under the original section 10. Thus, a larger amount of money than was provided for by the original law will become available for range improvements and for the benefit of the counties in which the lands are situated.

SEC. 14. *Public sales.*—Appropriate action was taken during the year on 266 applications for public sales.

SEC. 15. *Grazing leases.*—The restriction imposed by original section 15, under which regulations were approved January 8, 1936, as Circular No. 1375, that isolated tracts outside of grazing districts may only be leased for grazing purposes to owners of lands contiguous to the area sought to be leased, was removed by the amended act, and in its place broad authority is granted to the Secretary of the Interior to lease for grazing purposes any public lands outside of grazing districts, upon such terms and conditions as the Secretary may prescribe. Preference, however, is given to owners, homesteaders, lessees, or other lawful occupants of contiguous lands, to the extent necessary to permit the proper use of the contiguous land. Thus, it can be seen that section 15 has been brought into accord with the fundamental principles governing the allowance of licenses or permits in grazing districts. Furthermore, it was provided by the amendatory legislation that where the area sought to be leased is in the form of an isolated or disconnected tract embracing 760 acres or less, the owner, homesteader, lessee, or other lawful occupants of the contiguous or cornering land is to be given an absolute preference to lease the whole of such tract.

When the amended law was passed, approximately 2,255 applications for grazing lease were pending. Of this number about 1,600 involved lands within contemplated or proposed grazing districts, which applications were awaiting reports from the Director of Grazing. The remaining cases were awaiting reports from the Division of Investigations. When action on these cases is taken, due consideration must be given to the provisions of the amended law, and the regulations issued thereunder.

EMERGENCY CONSERVATION WORK

Among the many diversified projects being carried on by the Civilian Conservation Corps, perhaps none exemplifies better the true conservation nature of the work accomplished than the two camps situated at Gillette, Wyo. These camps are operated under the jurisdiction of the General Land Office.

The work consists in controlling the coal fires that for years without restriction have been destroying the irreplaceable coal deposits of the Federal Government in Campbell County. The smaller fires are being brought under control by digging out the fires and covering the exposed part of the coal vein, while the larger fires are being smothered by the application of a surface of from 10 to 20 feet of finely pulverized earth.

AREAS TO WHICH ACTIVITIES OF THE GENERAL LAND OFFICE EXTEND

Unappropriated and unreserved public lands.—Because of the withdrawals made by Executive orders of November 26, 1934, and February 5, 1935, no computations of areas of the remaining public lands have been made since June 30, 1934. The area of the unappropriated and unreserved public lands as of said date was approximately 165,695,497 acres, not including Alaska and not including small areas remaining undisposed of in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, and Wisconsin. Of such areas, 119,341,782 acres were surveyed, and 46,353,697 acres were unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which 2,044,421 acres were surveyed.

In computing the areas which were vacant and unreserved on the date mentioned, lands in pending, unallowed applications were considered as appropriated; but lands in applications for oil- and gas-prospecting permits, or in permits granted, or in applications for coal, phosphate, sodium, and/or sulphur, oil shale, or potash permits or leases, or in permits or leases granted, were considered as unappropriated. In view of the fact that the lands affected by the oil-shale order of withdrawal of April 15, 1930, or in designated geological structures of producing oil or gas fields, or in approved oil and gas leases were then subject to disposition under the Stock-Raising Homestead Act, such lands were treated as unappropriated.

The areas which were included in original entries, selections, filings, etc., during the fiscal years 1935 and 1936, were 2,169,357 acres in the public land States, and 15,555 acres in Alaska, a total of 2,184,912 acres. However, the net area of the public land was not

decreased to that extent as considerable land was restored to the public domain through the rejection of applications and the cancellation of entries.

CADASTRAL ENGINEERING SERVICE

The Cadastral Engineering Service of the General Land Office is the congressionally constituted agency having jurisdiction over the survey and resurvey of the public lands of the United States proper and Alaska, mineral location surveys, and the preparation of the technical and legal records thereof. The larger part of the cadastral engineering operations during the fiscal year ended June 30, 1936, was carried on under the regular appropriation for surveying public lands. In addition to the regular surveying program, the General Land Office continued to respond in large volume to the call of other governmental agencies charged with the administration and development of public lands under their jurisdiction. Included in the list of such applicants were several of the newer Federal agencies such as the Division of Grazing under the Taylor Grazing Act, and the Resettlement Administration and Agricultural Adjustment Administration of the Department of Agriculture.

During the year 1936 cadastral surveying projects were carried on in 31 States and the Territory of Alaska, under 212 separate groups 66 of which in 18 States were of resurveys. Accomplishment in much of this work, such as in field engineering investigations and many types of miscellaneous surveys, is not measurable on a quantity basis; however, on that part which can be so measured 15,754 linear miles embracing 2,341,000 acres, were surveyed or resurveyed. In addition, an extensive cadastral engineering project involving the survey of irregular tracts of farm land for the Agricultural Adjustment Administration in eight Eastern States along and adjacent to the Atlantic seaboard was brought to a close.

Arrearages in office work in practically all districts were brought up and made current. During the year surveys and resurveys in 238 townships were platted and approved, 155 supplemental and segregation plats (exclusive of 22 supplemental plats accompanying survey returns) were constructed, and the work of examining, platting, and approving 143 mineral surveys, embracing 386 locations, at an average office cost of \$20.37 per location, was accomplished, an increase in the number of mineral surveys, of approximately 50 percent over the previous year.

There were accepted and placed on file during the year plats representing 1,328,063 acres of original surveys of public lands and 1,576,706 acres of resurveys, comprising an aggregate area of 2,904,769 acres.

The wall map of the United States has been revised to show current changes since the publication of the 1934 edition. Preparation is being made for the printing of this map. A new map of Alaska has been issued, and the revised map of New Mexico is in the hands of the contractor for printing.

There were sold to the public 6,983 photolithographic copies of township plats, and 7,381 copies were furnished, without cost, to other bureaus and agencies for official use.

RECEIPTS AND EXPENDITURES

The total cash receipts from sales, leases, and other disposals of public lands (including receipts from copies of records, sales of Government property, etc.) were \$5,074,314.02 and from sales of Indian lands \$120,085.60, an aggregate of \$5,194,399.62, all of which was deposited in the Treasury. The total expenditure from operations was \$1,527,797. The excess of receipts over expenditures was \$3,666,602.62. The receipts were the largest in any year since 1930. They exceed last year's receipts by \$394,237.38.

Receipts under the mineral leasing acts.—Receipts from bonuses, royalties, and rentals under laws providing for the leasing of mineral rights on the public domain (including royalties and rentals from potash deposits and royalties on coal leases in Alaska) aggregated \$4,419,923.30, of which \$4,353,391.12 was received under the act of February 25, 1920 (41 Stat. 437). Under the provision of the said act each State receives 37½ percent of the receipts thereunder from the public lands within its borders, the reclamation fund receives 52½ percent, and the other 10 percent remains in the Treasury of the United States as miscellaneous receipts.

Receipts under the Taylor Grazing Act.—The amounts received as fees on grazing licenses aggregated \$48,271.34.

Under the provisions of the act, the States within which the lands are situated receive 50 percent of the receipts, and 25 percent thereof when appropriated by Congress may be expended for construction, purchase, and maintenance of range improvements within the grazing districts from which the receipts come.

Distribution of receipts.—Receipts from all sources, aggregating \$5,194,399.62, as shown above, are distributed under the law approximately as follows: Reclamation fund, \$2,489,538.05; to public-land States and certain counties within such States, \$1,950,906.37; general fund, \$633,869.60; and to various Indian tribes, \$120,085.60.

Five percent of the net proceeds from cash sales of public lands is paid to the public-land States within which such sales are made, and the balance of such receipts from States named in the Reclamation Act are credited to the reclamation fund; the reclamation fund

and the States involved receive (on the percentages shown above) 90 percent of the receipts under the Mineral Leasing Act and of receipts from potash deposits leased under the act of February 7, 1927; receipts from sales of reclamation town sites and camp sites and from royalties and rentals from potash deposits leased under the act of October 2, 1917, are credited to the reclamation fund; all of the receipts from proceeds of land and timber in the forfeited Oregon and California railroad grant will be paid to certain counties in Oregon in lieu of taxes; 25 percent of the proceeds of land and timber in the forfeited Coos Bay wagon-road grant will be paid to Coos County; the receipts from Indian lands (except 37½ percent of royalties from Red River oil lands, payable to the State of Oklahoma in lieu of taxes) are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows in detail the distribution of the receipts, insofar as is possible before final settlement of all accounts by the General Accounting Office.

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation fund	State and county funds	Total
Sale of public lands.....	\$22,356.27	\$50,789.82	\$2,549.86	\$75,695.95
Fees and commissions.....	33,552.33	103,239.44		136,791.77
Bonuses, rentals, and royalties from mineral leases.....	462,497.39	2,285,313.33	1,632,366.66	¹ 4,380,177.38
Proceeds of land and timber in Oregon and California railroad grant.....			259,320.81	² 259,320.81
Proceeds of land and timber in Coos Bay wagon-road grant.....	43,883.46		14,576.73	³ 58,460.19
Power permits.....	15,065.00			15,065.00
Fees from copies of records.....	12,619.32			12,619.32
Royalties and rentals from potash deposits under acts of Oct. 2, 1917, and Feb. 7, 1927.....	4,788.44	40,477.23	17,956.64	⁴ 63,222.31
Sale of reclamation town sites.....		9,718.23		9,718.23
Receipts from grazing lands, act of June 28, 1934.....	⁵ 24,135.67		24,135.67	48,271.34
Sale of standing timber, Alaska.....	5,270.56			5,270.56
Miscellaneous (rent of land, royalties on coal leases and fur farms in Alaska, trespasses on public lands, sale of town lots, Alaska, proceeds of Government property, etc.).....	9,701.16			9,701.16
Total.....	633,869.60	2,489,538.05	1,950,906.37	5,074,314.02
Sales and leases of Indian lands.....				⁶ 120,085.60
Aggregate.....				5,194,399.62

¹ First and fourth columns contain \$26,786.26 royalties received in Wyoming under act of June 26, 1926.

² It is estimated that this amount will be paid to certain counties in Oregon in lieu of taxes.

³ Twenty-five percent, \$14,576.73, is payable to Coos County.

⁴ Receipts under act of Oct. 2, 1917, amounting to \$15,337.94, are credited to the reclamation fund; receipts under act of Feb. 7, 1927, amounting to \$47,884.37, are distributed as follows: 52½ percent to the reclamation fund, 37½ percent to State funds, and 10 percent to the general fund.

⁵ Half of this amount (25 percent of receipts) is appropriated for range improvement, etc.

⁶ \$21,224.02 of this is Red River oil royalty, of which 37½ percent (\$7,959) is payable to Oklahoma and the balance (\$13,265.02) is credited to the Kiowa, Apache, and Comanche Indians.

REPAYMENTS

Under the repayment laws there were stated 68 accounts, allowing repayment of \$7,235.36, and 17 claims were denied. The claims

allowed included four accounts granting repayment of \$1,034.35, received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

HOMESTEADS

Actions taken.—Actions were taken as follows, in homestead cases: On final homesteads, 7,189; on original homesteads, 8,015; on second homesteads, 516; on applications for leaves of absence and extensions of time, 2,507; and in amendment cases, 367.

In this class of cases reports of special agents were considered in 1,852 cases, of which 1,122 were adverse and 730 favorable.

HOMESTEAD ENTRIES IN NATIONAL FORESTS

Upon recommendation of the Department of Agriculture 888 acres were restored to homestead entry under the act of June 11, 1906 (34 Stat. 233).

MISCELLANEOUS APPEALS IN EX PARTE CASES

Appeals in ex parte cases from actions of the registers, involving applications and entries filed under the homestead, timber and stone, and isolated-tract laws, were considered in 14,219 cases.

CONTESTS, OTHER THAN MINERAL CONTESTS

Approximately 1,350 contest cases other than mineral contests were considered. Approximately 225 hearings were held. At the close of the year about 200 contest cases were pending.

TIMBER AND STONE ENTRIES

Actions were taken in 20 cases on timber and stone entries and 63 cases on timber and stone sworn statements.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—During the year 1,080 cases were acted upon. For the same period there were delivered to the lessees 52 leases, embracing 35,123.52 acres, granted under section 14 of the leasing act; 5 under section 17, embracing 1,879.18 acres, and 1 under section 20, embracing 30.85 acres.

One lease of 160 acres was sold under section 17 of the act on September 30, 1935, in the Midway Oil Field, California, at a total bonus of \$1,490.

Action looking to the issuance of leases at public auction was suspended from August 21, 1935, the date of the amendatory act (49

Stat. 674), until May 7, 1936, when the regulations thereunder were approved as Circular No. 1386, except where the publication of the notice of sale had been commenced prior to the passage of the act. During the year 6 leases were canceled in entirety.

Oil and gas prospecting permits.—April 23, 1935, the Secretary granted a general extension of time on oil and gas permits to August 1, 1935, and on May 4, 1935, instructions were issued to suspend action on all applications for oil and gas prospecting permits then pending, or thereafter filed, pending legislation to amend the leasing act.

During the year ended June 30, 1936, 1,050 oil and gas permits were granted, embracing approximately 1,546,070.91 acres. Three permits were reinstated. There were 489 assignments acted upon, and 556 actions were taken on applications for extension of time. Over the same period, 490 permits were held for cancelation and 104 were canceled; 359 applications were rejected in entirety and 533 in part. There were 6,325 other actions taken.

Coal.—During the year, there were issued 48 coal prospecting permits covering 41,768.88 acres, 25 leases involving 3,083.86 acres; and 9 licenses for 270 acres. The total number of cases disposed of was 2,598.

Potash, sodium, sulphur, and phosphate.—There were no potash permits or leases issued during the year under the act of February 7, 1927 (44 Stat. 1057), pursuant to departmental orders nos. 799, 817, 854, and 914. However, six potash permits embracing 15,560 acres were issued in the previous year and not reported. One potash permit was extended and 69 were canceled. There were issued 1 sodium lease for 681.72 acres and 20 sodium prospecting permits involving 23,184.17. Twenty sodium permits expired by limitation, one was amended, and five were canceled. No sulphur permits issued during the year. One phosphate lease for 80 acres was issued and one lease was amended. There were 610 cases disposed of during the year involving the above minerals.

One hundred and ten leases, licenses, and permits issued for coal, sodium, etc., involving 84,428.63 acres.

Mineral entries.—There were approved for patent 110 entries.

Mineral applications.—Three hundred and seventy-one mineral applications were disposed of.

Mineral contests.—Exclusive of oil shale, Boulder Dam and Reservoir project, and the San Gabriel Canyon claims, there were 271 mineral contests disposed of.

Oil-shale claims under patent proceedings.—Five mineral entries for 31 claims were approved for patent.

Proceedings against mining locations.—Final action has been taken on all the reports, except two, submitted on mining claims in con-

flict with the right-of-way for reservoir purposes in the San Gabriel Canyon. All cases, except one contests, have been disposed of in the Boulder Dam and Reservoir project. In the Metropolitan Water District appropriate action was taken on 300 field reports.

RIGHTS-OF-WAY

One railroad right-of-way application was approved and 42 stock watering reservoir applications were disposed of. In addition, in other cases, 267 right-of-way applications were approved and 29 canceled. Six hundred and twenty-two other actions were taken.

FEDERAL RECLAMATION PROJECTS

There are 39 Federal reclamation projects in 14 Western States, 22 of which are operated in whole or in part by irrigation districts and water users' associations. There are in addition five Indian reclamation projects, the irrigation features of which are under the supervision of the Office of Indian Affairs.

During the year 616 original reclamation homestead entries and 182 assignments of such entries were received, and 240 reclamation entries were approved for patenting.

PRIVATE IRRIGATION PROJECTS

Two private irrigation projects were approved as dependable sources of water supply for desert land entries.

DESERT LAND ACT

Seventy-three entries were approved for patenting under the desert-land act.

CAREY ACT

Carey Act withdrawals and segregations amounting to 114,117.82 acres were considered, on which either final or interlocutory action was taken.

PITTMAN ACT

Forty-three applications were received under the Pittman Acts of October 22, 1919 (41 Stat. 293), and September 22, 1922 (42 Stat. 1012). Action has been taken in all but 19 cases.

SWAMP AND OVERFLOWED LANDS

Under the swamp-land acts, there were approved and patented to the States 1,137.21 acres and claims for 23,030.58 acres were finally rejected. New claims were asserted during the year for 2,575.62 acres.

STATE GRANTS AND SELECTIONS, EXCEPT UNDER TAYLOR GRAZING ACT

New indemnity school land selections embracing 38,937.04 acres were received during the year, and selections amounting to 154,187.62 acres were approved and title conveyed to the States. Such selections involving 9,380.81 acres were canceled. New selections under quantity grants to States, for specific purposes, embracing 3,664.81 acres, were received, and selections amounting to 99,715.23 acres were approved and title conveyed to the States. Canceled selections involved 80 acres.

Exchange selections were approved and patented to the State of Michigan under the act of July 31, 1912 (37 Stat. 241), embracing 14,673.53 acres.

New selections under the exchange provisions of section 2 of the Arizona Navajo Boundary Act of June 14, 1934 (48 Stat. 960), were received involving 27,033.87 acres.

Applications for patents for granted school sections under the provisions of the act of June 21, 1934 (48 Stat. 1185), were received, embracing approximately 1,753,800 acres.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections received, together with those on hand, amounted to 85,783.10 acres; 4,265.78 acres were certified or patented in lieu of such grants, and 90 acres of selections were rejected.

REVESTED OREGON AND CALIFORNIA RAILROAD AND RECONVEYED COOS BAY WAGON ROAD GRANT LANDS

Transactions concerning revested Oregon & California Railroad and Coos Bay Wagon Road grant lands for the fiscal year follow:

Restoration.—None of the revested Oregon & California Railroad grant lands were restored to homestead entry, and 819.65 acres were reclassified as timber land.

Timber sales.—Sixty-nine sales of timber on the revested Oregon & California Railroad grant lands were made during the past year, involving 4,528.03 acres of land, containing 158,665,000 feet, board measure, of timber, for which the sum of \$247,789.41 was received. Total sales to June 30, 1936, 1,040, involving 124,695.63 acres, containing 2,967,628,980 feet, board measure, of timber for which a total \$6,870,999.49 have been received.

Eight sales of timber on the reconveyed Coos Bay Wagon Road grant lands were made during the past year, involving 680 acres of land, containing 29,580,000 feet, board measure, of timber for which the sum of \$58,196.41 was received. Total sales to June 30, 1936, 111, involving 18,300.78 acres, containing 731,112,000 feet, board measure, of timber, for which a total of \$1,681,361.62 has been received.

Timber rights terminated.—Rights under timber patents were terminated in 139 cases.

ABANDONED MILITARY RESERVATIONS

The sum of \$5,069.29 was realized from the sale of lands in abandoned military reservations and 17 patents for such lands were issued.

ALASKA

Leases of public lands in Alaska for fur farming were approved in 2 cases, 3 assignments of leases were approved, 5 leases were canceled, and 5 applications for lease were rejected.

Five leases of public lands in Alaska for grazing were approved, one assignment of lease was approved, and one lease was rejected.

Purchases of small tracts in Alaska for home sites or headquarters were considered in 24 instances. Further action thereon awaits compliance by the applicants with requirements under the regulations.

Trade and manufacturing site applications in Alaska were considered in 20 cases and one patent was issued.

AVIATION LEASES

Two leases of public lands for public aviation fields were approved, two applications were rejected, and appropriate actions were taken in connection with 39 leases.

COLOR OF TITLE

The sale of improved or cultivated public lands held under color of title for more than 20 years resulted in the issuance of 27 patents, from which the sum of \$4,147.62 was received.

Five patents issued for lands formerly involved in the boundary dispute between the States of Texas and New Mexico, and the sum of \$346.38 was received therefrom.

Five applications were considered under the New Mexico Color of Title Act of February 23, 1932 (47 Stat. 53), and nine Refugio Colony cases were considered under the act of February 3, 1911 (36 Stat. 896).

EXCHANGES OF PRIVATELY OWNED LANDS, EXCEPT UNDER TAYLOR GRAZING ACT

Many acts of Congress provide for the extinguishment of private holdings within national forests, parks, monuments, grazing districts, and Indian reservations, by means of the exchange of Government land for privately owned land. Twenty-five patents were issued and title was accepted to 102,786.94 acres of land for inclusion in national forests. One exchange was consummated whereby private ownership of 2,560 acres of land within the Chaco Canyon National Monument was eliminated. Three patents were issued pursuant to the act of March 3, 1921 (41 Stat. 1225, 1239), which resulted in title to 77,763.53 acres of land being relinquished to the United States. Applications for exchanges in the interest of consolidating Government ownership within grazing districts were considered in 26 cases. Four patents were issued pursuant to the forest lieu selection act. One exchange was consummated under the act providing for the consolidation of the Lincoln National Forest, N. Mex., and title in behalf of the Government was accepted to 6,299.80 acres. Regulations were issued to govern exchanges of public lands in the interest of establishing migratory bird and other wildlife refuges. Thirty patents were issued and title was accepted to 1,769.44 acres of land in exchanges providing for the consolidation of Indian reservations.

INDIAN LANDS AND CLAIMS

During the year extensions of time for the cutting and removing of timber on ceded Chippewa Indian lands in Minnesota were granted on two contracts, and one contract was canceled.

The purchase of ceded Indian lands was considered in 862 cases, resulting in the issuance of 168 patents from which the sum of \$56,632.45 was realized.

Homesteading on ceded Indian lands was considered in 3,594 instances and 296 patents were issued.

Allotments of lands to Indians required 415 actions and 249 trust patents were reissued while 26 original trust patents were issued.

Claims by non-Indians for lands within confirmed Indian pueblos in New Mexico were considered in 750 cases and 712 patents were issued.

PRIVATE-LAND CLAIMS

Action on private-land claims provided for by many acts of Congress passed in the early history of the Government required 259 actions and 44 patents were issued.

SOLDIERS' ADDITIONAL HOMESTEAD RIGHTS

Rights granted in certain cases to Civil War veterans, their widows, and minor children required 382 actions and 7 patents were issued.

TIMBER

One hundred and fifteen letters and reports involving sales of dead, down, or damaged timber were considered. The sum of \$3,872.75 was realized from such sales.

The free use of timber under permit was considered in 89 cases.

TOWN LOTS AND TOWNSITES

Town-site matters were considered in 44 cases with 2 patents issuing, while town-lot sales were considered in 746 instances with 205 patents issuing, from which the sum of \$26,089.42 was realized.

TRESPASS

The amounts accepted in settlement for trespasses on the public lands, together with the number of instances in which trespasses were considered, are as follows: 214 coal trespasses, \$6,759.22; 554 timber trespasses, \$9,332; 17 grazing; 7 gravel; 1 fire; 1 rock; and 1 turpentine trespasses.

MISCELLANEOUS CASES CONSIDERED

Other actions were taken and patents issued as follows: Cemetery applications, 13, with 1 patent issuing; drainage, 67, with 3 patents issuing; military bounty land warrant cases, 22, with 7 patents issuing; park applications, 5, with 2 patents issuing; preemption applications, 15, with 2 patents issuing; quitclaim deeds, 7 issued; riparian ownership, 1, with 1 patent issuing; scrip, 5, with 3 patents issuing; small holding claims, 33, with 3 patents issuing. In the Mud Lake cases, Minnesota, 19 claims for relief under the act of June 26, 1934 (48 Stat. 1440), were approved for sums aggregating \$31,324.89. Four patents were issued under special acts.

WITHDRAWALS AND RESTORATIONS

One new driveway was established and 11 driveways were reduced, resulting in the withdrawal of 320 acres and the release of 17,917 acres from former withdrawals.

The tables which follow give the estimated total areas in outstanding withdrawals and classifications as of June 30, 1936, other than the general withdrawals made by Executive orders of November 26, 1934, and February 5, 1935:

Withdrawals other than mineral withdrawals and classifications

	<i>Total area withdrawn June 30, 1936</i>		<i>Total area withdrawn June 30, 1936</i>
Stock driveways-----	9, 743, 599	Oregon-California and Coos	
Recreational area withdrawals--	284, 111	Bay unrestored timber land--	1, 245, 832
Air-navigation sites-----	32, 085	For forest exchange with New	
Carey Act segregations-----	174, 817	Mexico-----	681, 000
Reclamation withdrawals-----	21, 712, 696	For game and bird refuges--	162, 701
San Carlos irrigation project		For national-forest purposes--	139, 640
(Indian)-----	136, 860	For national parks and monu-	
Fort Hall irrigation project		ments-----	3, 943, 415
(Indian)-----	114, 720	For New Mexico-Arizona In-	
Fort Peck irrigation project,		dian consolidation-----	1, 134, 972
Montana-----	204, 720	For agricultural experiment	
Bonneville Dam, Oregon-Wash-		stations-----	309, 734
ington-----	79, 080	For flood and erosion control--	9, 870
Water-power reserves (non-In-		For State game refuge classifi-	
dian)-----	5, 180, 591	cation-----	44, 000
Reservoir and well sites-----	254, 130	For recreational classification--	42, 348
Public water reserves-----	495, 028	For irrigation-power classifi-	
Los Angeles water supply ¹ ---	866, 365	cation-----	30, 880
Mizpah-Pumpkin Creek grazing		For archaeological classifica-	
district-----	25, 124	tion-----	11, 297
Grazing withdrawals (not in-		Cooperative lookout stations--	767
cluding withdrawals under		For miscellaneous purposes---	1, 644
Taylor Grazing Act)-----	3, 425, 840		
Grazing districts under Taylor		Total-----	130, 293, 050
Grazing Act-----	79, 805, 186		

¹ Includes Owens River-Mono Basin grazing district.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

A summary of the outstanding mineral withdrawals and classifications as of June 30, 1936, is as follows:

	Withdrawn	Classified
	<i>Acres</i>	<i>Acres</i>
Coal-----	26, 971, 813	33, 276, 103
Oil-----	5, 168, 593	71, 884
Oil shale-----	5, 989, 949	4, 081, 208
Phosphate-----	1, 889, 601	302, 219
Potash-----	9, 411, 906	
Total-----	49, 431, 862	37, 731, 414

The area of the withdrawn oil land, shown above, includes 13,578 acres withdrawn as a helium reserve. The figures given include much land which has been patented with or without a reservation of minerals. The areas so patented have not been computed. However, some or all minerals have been reserved in patents aggregating 40,641,782 acres issued under the stock-raising and other laws, for lands not withdrawn or classified as valuable for minerals, as well as for lands so withdrawn or classified.

TABLES

The following tables show the facts as to entries made, patents issued, etc., during the fiscal year:

Original entries, fiscal year of 1936

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	767	307, 299	45	19, 032
Enlarged	39	10, 152	3	738
Reclamation	56	6, 656	35	4, 843
Forest	9	676		
Sec. 2289, et al.	338	32, 674	21	1, 586
Total homesteads	1, 209	357, 457	104	26, 199
Deserts	25	2, 964	1	40
State selections	67	37, 261		
Railroad selections	1	440		
Applications and filings	134			
Miscellaneous	114	1, 470	2	3
Total	1, 550	399, 592	107	26, 242
Indian land as above	107	26, 242		
Grand total	1, 657	425, 834		

Final entries, fiscal year of 1936

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising	3, 345	1, 503, 502	147	57, 150
Enlarged	451	117, 127	188	35, 138
Reclamation	181	16, 283	26	2, 277
Forest	44	3, 765		
Commuted	21	1, 743	27	2, 727
Sec. 2289, et al.	1, 179	124, 281	66	8, 093
Total homesteads	5, 221	1, 766, 701	454	105, 385
Deserts	81	11, 355	2	193
Public auction	2	120		
Timber and stone	15	1, 131		
Mineral	103	6, 144	6	4, 106
Miscellaneous	607	19, 265	257	23, 126
Total	6, 029	1, 804, 716	719	132, 810
Indian land as above	719	132, 810		
Grand total	6, 748	1, 937, 526		

Patents and certificates, fiscal year of 1936

	Number	Acres
Homesteads:		
Stock raising.....	3,332	1,590,678
Enlarged.....	540	127,154
Reclamation.....	236	20,904
Forest.....	56	5,219
Sec. 2289, et al.....	1,146	123,182
Total homesteads.....	5,310	1,867,137
Deserts.....	72	14,196
Public auction.....	184	21,781
Timber and stone.....	22	2,121
Mineral.....	108	14,866
Railroad.....	6	4,270
Miscellaneous.....	2,536	292,313
Total patents.....	8,238	2,216,684
Certified to States.....		253,903
Grand total.....		2,470,587

State grants—Areas patented or certified in fiscal year 1936

State	Swamp-land patents	School section indemnity certifications	Quantity grant certifications	Exchange, act of July 31, 1912	State	Swamp-land patents	School section indemnity certifications	Quantity grant certifications	Exchange, act of July 31, 1912
Alabama.....			1,625		Montana.....		1,484		
Arizona.....		129,706	2,877		New Mexico.....		19,985	6,010	
California.....	127	341	89,203		Utah.....		1,556		
Florida.....	538				Wyoming.....		1,116		
Iowa.....	220				Total.....	1,137	154,188	99,715	14,932
Louisiana.....	172			14,932					
Michigan.....	80								

Railroad grants—Land approved in fiscal year 1936 for patent or certification

	State	Acres
TO CORPORATIONS		
Atlantic & Pacific (now Santa Fe Pacific).....	New Mexico.....	240
Central Pacific.....	California.....	3,155
Do.....	Nevada.....	871
Total.....		4,266

GEOLOGICAL SURVEY

(WALTER C. MENDENHALL, *Director*)

During the fiscal year 1936 the aggregate expenditures for which the Geological Survey was responsible amounted to about \$4,620,000, as compared with nearly \$5,328,000 during the preceding year. These aggregates were made up of the regularly appropriated funds, the cooperative funds from States, counties, and municipalities, the funds transferred from other departments of the Government for types of work falling within the Survey's field, and the emergency funds derived chiefly from the Public Works Administration and devoted largely to mapping of various types, to construction of stream-gaging stations, to conservation work on public lands, and in a lesser degree to the study of mineral resources.

Although there was a decline from the preceding year in aggregate funds available, the fiscal situation has nevertheless improved, because the Congress, in view of the decreasing availability of emergency funds, had increased the regular appropriation to \$2,285,500 from the \$1,631,000 of the preceding year and before the end of the fiscal year 1936 had provided a little more than \$2,800,000 for the fiscal year 1937.

As a part of our informal service to the public, 5,000 tests of mineral and rock samples were made and over 1,200 chemical analyses were completed.

Between 18,000 and 19,000 square miles of new area was surveyed in the field topographically. This work will yield 139 new contoured topographic maps of areas in 43 States. In addition, by the aid of aerial photography, 31,600 square miles was surveyed for the production of base maps without contours.

Congressional interest in the inadequate rate at which mapping is proceeding was clearly indicated during the second session of the Seventy-fourth Congress. This interest was expressed in the form of Senate Resolution 281, introduced by Senator Hayden, of Arizona, calling upon the Secretary of the Interior to submit to the Seventy-fifth Congress a report and plan for the completion of the mapping of the United States.

With this better fiscal situation, it has been possible to resume, on a more nearly normal scale, the regular services of the Geological Survey; to improve the personnel situation, which was acute 3 years

ago; and again to issue a gratifying volume of Survey products in the form of reports and maps, thus supplying to the Nation the results obtained by the Survey's skilled staff.

Fifty book publications of the Survey's regular series, aggregating nearly 9,000 pages of printed matter, dealing with geology, mineral resources, and water supplies, were issued during the year, and about 700,000 copies of 281 topographic and other maps were printed. A new geologic map of Colorado, long in demand, came from the presses, and substantial progress was made toward the completion of the geologic map of Texas.

There were 50 geologic parties in the field in 35 States. The field investigations on several continuing projects were completed, and it was possible to initiate a number of new investigations, such as systematic studies of the alunite deposits at Marysville, Utah, of the lead and zinc deposits of the Metaline district, in Washington, and of the granites of the Northeastern States.

Measurements of stream flow were maintained at 3,163 stream-gaging stations. All the States, the District of Columbia, and Hawaii are affected by this work. A report on the droughts of 1930 to 1934 and a series of notable flood studies resulting from cooperation with other Federal agencies were published during the year.

The work on underground waters, so important in the drought-stricken areas, was continued, much of it in cooperation with the States, and some 50 reports on this topic, many of them informal, were released for public use.

In the land-classification and mineral-leasing activities of the Survey substantial progress was made, although insufficient personnel and expanding mining activities rendered inadequate our work in safeguarding the Government's interest as owner of great resources in coal, oil and gas, potash, phosphate, and other minerals. The situation will be improved in 1937 as a result of more liberal provision for this work by the Congress. Despite the handicaps, 317,000 acres of public lands were classified as nonoil, nearly 200,000 acres were defined as within "known geologic structures" in accordance with the requirements of the mineral land leasing act of 1920, and technical supervision was given to over 8,000 mineral properties on public lands containing oil and gas, nearly 700 containing coal, and 170 containing other minerals, also to nearly 5,600 oil and gas leases on Indian lands.

An event of particular interest during the year was the retirement of Dr. T. W. Stanton, chief geologist, on September 30, 1935, at the age of 75. Dr. Stanton was appointed to the staff of the Geological Survey in 1889 and hence had spent 46 years in the Government service. His special field had been the paleontology of the Cretaceous

system, but his accurate work on stratigraphy gave special validity to his age determinations and early made him the chief reliance of the geologists of this continent on the relations of the rocks of this system. Dr. Stanton was long in charge of the important section of paleontology and stratigraphy in the geologic branch, and in this position he exercised a valuable influence on the development of our concepts of stratigraphic relationships in the United States and through his chairmanship of the committee on geologic names guided procedure in this difficult field for many years. He became chief geologist on February 1, 1932, and retained this position until his retirement. Dr. G. F. Loughlin, long in charge of the section of metalliferous deposits, succeeded Dr. Stanton as chief geologist and was in turn succeeded as chief of the metalliferous section by Dr. D. F. Hewett.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—Fifty field parties were active during the year, and work was done in 35 States. Most of the Federal field projects financed with funds from the Public Works Administration were completed before the beginning of the fiscal year, but some further studies were made in the gold-bearing areas of the Southeastern States and in the quicksilver field of Arkansas. Work was continued throughout the year on the metal-mining districts of Colorado, Idaho, and New Mexico and the oil and gas region of Kansas, in cooperation with the States, and some further assistance was given to the Arizona Bureau of Mines in its survey of the Tombstone district. Physiographic and geologic studies were made in the Yosemite, Sequoia, and Zion National Parks, in cooperation with the National Park Service. Several major projects begun in 1935 were continued, and toward the end of the year new major projects were begun in the Marysvale district, Utah, the Metaline district, Washington, and some of the leading granite districts of the Northeastern States. Areas of forest lands were geologically examined for the Forest Service, and dam and reservoir sites were examined for the Office of Indian Affairs and the Natural Resources Board. Increasing attention was given to fundamental "borderland" problems involving geology, chemistry, and physics. More than 5,000 tests of mineral and rock samples were made, including 1,225 chemical analyses in connection with the Geological Survey's projects and 1,065 tests for persons not officially connected with the Survey. Many tests were made of bleaching clays, two deposits of which are now being developed commercially, largely as a result of tests made in the Survey's laboratory. Temperature measurements of deep wells were made in nine States, mainly in oil fields.

Explorations in Alaska.—In the field season of 1935 seven field projects were carried on in Alaska, two of which were primarily topographic and five primarily geologic. The usual general survey of recent mining developments and the collection of mineral statistics were continued. Five field projects for the season of 1936 were under way at the end of the fiscal year, and two additional geologic projects were planned to begin early in July. These will be continued throughout the open season.

Topographic mapping.—The area covered by new topographic surveys, re-surveys, and revision amounted to 18,555 square miles, representing 139 topographic maps with contours. The topographic mapping was done in 43 States.

There was also a large increase in the area covered by planimetric maps without contours, resulting from aerial photography, which covered 31,654 square miles in eight States. In addition, aerial photographs were used as bases for topographic mapping in 20 quadrangles. Stereoscopic plotting apparatus, utilizing single-lens aerial photographs, as a practical demonstration of the use of such equipment in connection with topographic mapping, is being extensively applied in the mapping of the Tennessee River Basin in cooperation with the Tennessee Valley Authority. The sectional transportation map of the United States being made for the Bureau of Public Roads was continued with increased output. The maps of Florida, in 12 sections; New Hampshire, in 2 sections; Maine, in 6 sections; and Vermont, in 2 sections, were published. These transportation maps on the scale of about 4 miles to 1 inch show transportation routes of all kinds in a variety of colors.

Investigations of water resources.—The water-resources branch collected and made available for publication stream-flow records at 3,163 river-measurement stations on rivers in the 48 States, the District of Columbia, and the Territory of Hawaii, obtaining thus authentic information on the behavior of streams in drought, in flood, and in normal conditions—information which is invaluable for intelligent planning of projects for use or control of the surface water supply. It investigated underground water supplies in 21 States and Hawaii and obtained basic information on the occurrence, quantity, and quality of underground water supplies which is essential for the development, conservation, and use of ground water upon which a large part of the population of the country must depend. In collaboration with the Mississippi Valley Committee of the Public Works Administration, and with the assistance of special advisory committees of the American Society of Civil Engineers and the American Geophysical Union, studies were made of floods in the United States, with especial reference to their magnitude and frequency, and of the relation of rainfall and run-off in the United States, and the results were published in Water-Supply Papers 771 and 772. The favorable reception of these two reports indicates that they have filled a need for computations of flood data and for interpretations of the relation of rainfall and run-off. The drought studies have been continued. Investigations of stream-flow and silt movement of streams in eight projects of the Soil Conservation Service and similar studies on the Colorado River have also been continued. Monthly and annual reports on the production of electricity for public use and the consumption of fuel in generating the electricity were made. Engineers of the branch had general supervision of operation of permits and licenses of the Federal Power Commission in connection with 145 projects. Investigations of the water problems along the international boundary between the United States and Canada were continued for the State Department. The collection of information on recent outstanding floods was started. A report on the thermal springs in the United States and a report on ground-water levels and artesian pressures in the United States up to January 1, 1936, were completed and sent to the printer. About 50 reports giving the results of technical investigations relating to ground water were released. Analyses, partial or complete, were made of 1,481 samples of water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural use and for domestic use (not related to questions of health).

Classifying and leasing public land.—The conservation branch made 4,917 formal findings of technical fact involving the mineral resources, water power, or storage possibilities of public lands; classified 317,766 acres of public land as nonoil in character; added 46,174 acres to outstanding water-power reserves

and eliminated 10,934 acres therefrom; defined the "known geologic structure" of 13 producing oil and gas fields, amounting to 196,304 acres; completed 1,615 miles of river-utilization surveys and 520 square miles of reservoir surveys in public-land States; supervised operations and activities under 151 power projects licensed by the Federal Power Commission and 317 permits and grants from the Interior Department; supervised on public lands 8,332 oil and gas holdings involving 3,849 productive wells, 694 coal properties, 95 potash properties, 40 sodium properties, 26 sulphur properties, 9 phosphate properties, and 1 oil-shale property; supervised on naval petroleum reserves 23 leaseholds, involving 533 productive oil and gas wells, and on Indian lands 5,583 leaseholds, involving 4,356 oil and gas wells, 36 lead and zinc properties, 109 coal properties, 1 asphalt property, and 1 lime phosphate property; assisted hundreds of oil and gas permittees and operators in preparation of unit plans of development and operation; acted on 279 such plans; and assisted in the formulation of regulations under the act of August 21, 1935.

Publications.—The publications of the year comprised 50 pamphlets in the regular series, covering a total of 8,901 pages; 114 new or revised topographic and other maps; 167 reprinted topographic and other maps; and several pamphlets for administrative use. Among the notable book publications were professional papers on the Gold Hill mining district, Utah, the Montezuma quadrangle, Colorado, the minerals of Franklin and Sterling Hill, N. J., and the pre-Cambrian rocks of the Lake Superior region (with a revised geologic map); bulletins on the San Juan region, Colorado, the Book Cliffs coal field, Utah, the Casto quadrangle, Idaho, the Bellefonte quadrangle, Pennsylvania, the southern Alaska Range, the Salt Valley anticline, Utah, the Monument Valley-Navajo Mountain region, Utah, and the Coastal Plain of South Carolina; and water-supply papers on water utilization in the Snake River Basin, ground water in south-central Tennessee, droughts of 1930-34, floods in the United States, and relations of rainfall and run-off in the United States. Besides the regular publications, 31 brief papers were issued in mimeographed form as memoranda for the press.

The engraving division printed more than 701,000 copies of maps and did repay work amounting to about \$208,000 for more than 75 other Government units and State governments.

NOTE.—Detailed tabular statements are given at the end of the report.

GEOLOGIC BRANCH

SUMMARY

Fifty field parties were actively at work during the year, and work was done in 35 States. Most of the Federal field projects for which funds had been allocated by the Public Works Administration were completed before the beginning of the fiscal year 1936. Small balances, however, remained in the allotments for continuing the mapping of gold-bearing areas in the Southeastern States (project 183), and additional work was done in Georgia and the Carolinas. A brief reexamination of the Arkansas quicksilver field (project 184) was also made. Preliminary reports covering many of the Federal projects have been released as press notices and submitted to State organizations and technical journals for publication.

Work was continued throughout the year on metal-mining districts in Colorado, Idaho, and New Mexico, and in the oil fields of Kansas in cooperation with the States. The geologic map of Colorado, embodying the results of 10 years of cooperative work, was published. Further assistance was rendered to the Arizona Bureau of Mines in a survey of the Tombstone district. Physiographic and geologic studies were made in the Yosemite and Sequoia National Parks, Calif., and in the Zion National Park, Utah, in cooperation with the National Park Service.

Several of the major projects begun in 1935 were continued in 1936, and toward the end of the year new projects were begun in the Marysvale district, Utah, the Metaline district, Washington, and some of the leading granite districts of the Northeastern States. Field work in the Comstock district, Nevada, was nearly completed.

Work for other Federal organizations included the geologic examination of forest lands for the Forest Service and of dam and reservoir sites for the Office of Indian Affairs; also the furnishing of maps and information to the Reconstruction Finance Corporation and the Securities Exchange Commission, the Procurement Division of the Treasury Department, and the Architect of the Capitol.

WORK OF THE YEAR BY STATES

Alabama.—Geologic mapping was continued in the Russellville and other brown iron ore districts in eastern Alabama, including parts of Franklin, Butler, Cleburne, Clay, and Lowndes Counties, and in the manganiferous iron ore area in Cherokee County. A report on the red iron ore formation in northeastern Alabama is well advanced. A press notice giving some results of the investigations for ceramic and bleaching clays in the State was issued, and a more detailed report on clays in Alabama will be included in a report to be published by the Survey on clays in the Southern States. Work on gold in Alabama is mentioned under Southern Appalachians.

Arizona.—A preliminary report on the geology and ore deposits of the Ajo quadrangle was transmitted to the Arizona Bureau of Mines for publication, and a complete report is in preparation for publication by the Survey. Further field examinations were made in the Tucson area in connection with the detailed report in preparation on the geology and mineral resources of the area and in the Tombstone mining district in informal cooperation with the Arizona Bureau of Mines.

Arkansas.—The manuscript of a report on the geology and mineral resources of the western portion of the Arkansas coal field and one on the quicksilver deposits of Arkansas have been completed for Survey publication, and one on the geology of the Arkansas bauxite region was transmitted to the Arkansas Geological Survey. A paper on the stratigraphy of the Arkansas-Oklahoma coal basin has been submitted for publication in the Bulletin of the American Association of Petroleum Geologists. David White's report on fossil plants from the Stanley shale and Jackfork sandstone in southeastern Oklahoma and western Arkansas was completed and submitted for publication as Professional Paper 186-C, and studies were continued on the Morrow formation of Arkansas

and Oklahoma, on the stratigraphy of the Bloyd shale near Fayetteville, and on the manganese carbonate deposits of the Batesville district. A preliminary paper on Radiolaria in the Arkansas novaculite, Caballos novaculite, and Big Fork chert, and a paper on unusual oolites from the Brentwood limestone near Fayetteville were submitted for outside publication.

California.—Studies of the geomorphology of the Sequoia National Park and its environs were made in cooperation with the National Park Service, and an outline of the geologic history of Sequoia National Park and a map of the Pleistocene glaciers in and adjacent to Yosemite National Park were prepared for the Park Service. Geologic studies of the San Andreas rift and of the Death Valley region were continued. Field studies were conducted on the structure, stratigraphy, and oil resources of the lower Tertiary strata in Reef Ridge, in the Coalinga region; on the oil resources and subsurface structure and stratigraphy of the Mountain View and Edison fields, near Bakersfield; on diatom-bearing deposits of the Monterey and Temblor formations in the vicinity of Bakersfield and Coalinga; and on the Monterey shale problem, and additional field data were obtained in the Kettleman Hills oil and gas fields and on the north slope of the San Pedro Hills.

Several reports on the Kettleman Hills oil and gas fields are in preparation, including one on the lithologic descriptions of the subsurface sections, status of wells and zonal correlation, and economic phases; another on the stratigraphy and paleontology of the North Dome; and another on the general geology and oil resources of the Kettleman Hills. A detailed report on mineral resources in the region tributary to the Boulder Dam is in press as Bulletin 871. Papers were submitted to the American Association of Petroleum Geologists on Miocene stratigraphy and paleontology of the Palos Verdes Hills, and the proportion of organic matter converted into oil in the Santa Fe Springs field.

Colorado.—Cooperation was continued with the Geological Survey Board of the State of Colorado and the Colorado Metal Mining Fund in investigations of mining regions of the State. In the San Juan area of southwestern Colorado mapping was continued in the Ouray, Sneffels, and Red Mountain districts and the La Plata Mountain region. Investigations were continued in the Cripple Creek area, the Jamestown district, the Nederland tungsten district, and other areas in the Front Range, and in the Alma and Horseshoe districts in the Mosquito Range. The new geologic map of Colorado, embodying the results of 10 years of cooperative work, was published by the United States Geological Survey. Cooperative reports on ore deposits in the vicinity of the London fault, and on the general geology and mineralization of the Snowmass area, Gunnison County, were completed during the year and will be published as bulletins of the Survey.

A preliminary report on the resurvey of the geology and ore deposits of the La Plata district was submitted to the Colorado Scientific Society for publication. Scientific papers resulting from the cooperative work include Crystallization of Granodiorite Magma (based largely on studies in the Ouray district), Structure of pre-Cambrian Granites in Central Boulder County (American Geophysical Union), Thrusting in Huerfano Park, Colo., and Related Problems of Orogeny in the Sangre de Cristo Mountains (Geological Society of America), and Structure and Mineralization along the London Fault (American Institute of Mining and Metallurgical Engineers). Investigations of dam sites on the Pine River in La Plata County were made for the Office of Indian Affairs. A paper on stratigraphy of the Upper Cretaceous rocks north of the Arkansas River in eastern Colorado will be published in the Survey's

Contributions to General Geology. A report on the Dawson and Laramie formations in the southeastern part of the Denver Basin, Colo., will be published in the Bulletin of the American Association of Petroleum Geologists.

District of Columbia.—A report on gravel and sand in the District of Columbia, resulting from studies made under a Public Works Administration allotment, has been completed and will probably be published as a bulletin of the Survey. A geologic map of the District of Columbia, with descriptive text, is in preparation for Survey publication.

Florida.—A preliminary report on some clays in Florida was issued as a memorandum for the press, and a more detailed report covering investigations will be included in a Survey bulletin on clays in the Southern States. The Tampa and Suwannee limestones are being studied in informal cooperation with the State of Florida. A short paper on additions to the molluscan fauna of the Alum Bluff group will be published by the Florida Geological Survey.

Georgia.—Geologic mapping was done in the Coastal Plain region of Georgia, in informal cooperation with the State, for the purpose of revising the geologic map of the State. A paper giving the general results of a preliminary investigation of the Georgia bleaching clays was published by the Division of Geology of Georgia. Work on the gold deposits of Georgia is mentioned under Southern Appalachians.

Idaho.—In cooperation with the Idaho Bureau of Mines, field work was continued in the Murray, Warren, and Florence mining districts, in the Coeur d'Alene region, and the Boise Basin, and progress was made in the preparation of reports on the Boise Basin, Thunder Mountain, Edwardsburg, Yellow Pine, and Warren mining districts. A party including Survey geologists made an expedition down the gorge of the Salmon River, and a paper on the results of this exploratory trip, entitled "Idaho's river of no return", was submitted to the National Geographic Society. A paper on the geomorphology of south-central Idaho was submitted for publication by the Geological Society of America. A detailed investigation of the geology and mines of the Dickey or Borah Peak quadrangle was begun, and a brief field examination was made in the vicinity of Idaho Falls and Blackfoot for the purpose of reviewing the geology of those areas in connection with the preparation of a report on the geology and mineral resources of the Paradise Valley and Ammon quadrangles.

Illinois.—The complete report on investigation by geologic mapping and geophysical studies of the Cave-in-Rock and Rosiclare districts, southeastern Illinois, is in course of preparation for Survey publication. A preliminary report on the Cave-in-Rock fluorspar reserves was transmitted to the Illinois Geological Survey, and a paper on geologic interpretations of fluorspar reserves in the Illinois-Kentucky field was presented at an industrial conference at Rosiclare. Some progress was made toward bringing to completion the report on the Pottsville flora of the eastern interior basin, mainly in Illinois, a cooperative project with the State, left unfinished by the late David White.

Indiana.—A paper on the flora of the New Albany shale is mentioned under Kentucky. The report on the Pottsville flora of the eastern interior basin is mentioned under Illinois.

Kansas.—Under a cooperative agreement with the Kansas Geological Survey an investigation was made of the limestones of Mississippian age found in deep wells in the eastern and southeastern parts of the State. The report on geologic investigations of the Shoestring oil-bearing sands of Greenwood and Butler Counties was transmitted to the Kansas Geological Survey for publication. Work in the Kansas portion of the lead and zinc area is mentioned under Oklahoma.

Kentucky.—A press memorandum giving some preliminary results of the investigation of bleaching and ceramic clays of Kentucky and western Tennessee was issued. A more detailed report of these investigations will be included in a Survey bulletin on clays of the Southern States. The Calamopityeae and Their Relationships, which will form part 2 of the series on the flora of the New Albany shale, was sent to the printer for publication as Professional Paper 186-E. Samples were collected from Lower and Upper Elkhorn coals from Pike County for the purpose of making a study of the effect of regional metamorphism.

Work on the Pottsville flora and on fluorspar in Kentucky is mentioned under Illinois.

Maryland.—Studies of the geology and mineral resources of Frederick County were continued in cooperation with the Maryland Geological Survey, and a paper on revision of the age of the limestone of Frederick County was presented at a meeting of the Geological Society of America. The new excavations along the Chesapeake-Delaware Canal were intermittently examined as the work progressed. The results of the studies of structural materials, chiefly sand and gravel deposits, of eastern Maryland adjacent to Baltimore, will be published as a Survey bulletin. Three papers were presented for outside publication under the following titles: Are the Maryland Terraces Warped? Structure of the Coastal Plain of Southern Maryland, and Some Fossil Conifers from Maryland and North Dakota.

Minnesota.—Some granite and limestone quarries around St. Cloud and Mankato were examined.

Mississippi.—In the study of the areal and structural geology of the Jackson area, the mapping of the Morton, Pelahatchee, Florence, and Jackson quadrangles and a part of the Raymond quadrangle was completed. Some preliminary results of these studies were published in two papers—Upper Cretaceous and Lower Tertiary History of the Jackson Area (Journal of the Washington Academy of Sciences), and Factors Affecting the Geologic History of the Jackson Area, and Carboniferous Rocks at Jackson (Bulletin of the American Association of Petroleum Geologists). A report on the preliminary investigation of the bleaching clays of Mississippi was submitted to the Mississippi Geological Survey. A detailed report on the clays of Mississippi will be included in a Survey bulletin on clays of the Southern States.

Missouri.—A paper on correlation of the Upper Cambrian sections of Missouri and Texas with the section in the upper Mississippi Valley will be published in the Survey's Contributions to General Geology.

Montana.—Geologic mapping for the purpose of completing geologic studies of the Little Rocky Mountain region and making a study of the oil, gas, and mineral resources of the mountains and adjoining area, including the gold deposits in the vicinity of Landusky, was begun in the later part of the year. Continued field studies were made of the Tertiary and Pleistocene faulting in Granite and Lewis and Clark Counties, of the glacial geology and physiography of western Montana and the Glacier National Park, of gold placers of the Pioneer district in Powell County, and of gold-placer operations in the vicinity of Helena and at Virginia City. Reports are in preparation on the geology and ore deposits of the Libby quadrangle, the Pioneer gold district, faults in southwestern Montana, fossil plants from the Fort Union and associated formations, and glacial geology and physiography of western Montana and the Glacier National Park. A report on the geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties was completed and will be published as Bulletin 847-F.

Nevada.—The resurvey of the Comstock lode, at Virginia City, begun in 1935, was nearing completion at the end of the fiscal year, and further geologic mapping was carried on in the Hawthorne and Tonopah quadrangles, where a detailed study of the geology and ore deposits is being made. Reports on the underground geology of the Tonopah, Tuscarora, Chief, and Delamar districts have been submitted for publication by the Nevada Bureau of Mines and Geology, and one on the Searchlight district is in preparation. A short paper on sedimentary magnesite in the Boulder Dam region was submitted to the Society of Economic Geologists, and one on the scheelite-leuchtenbergite vein in the Paradise Range to the Mineralogical Society. Work in the Boulder Dam region is mentioned under California.

New Mexico.—Studies of the geology and mineral resources of the Little Hatchet Mountains, begun in 1935, were continued. Field investigations of the Mancos and Mesaverde formations around the southern edge of the San Juan Basin were made in connection with a report on conditions of sedimentation in this area, and a preliminary field survey of the geology of the Potash Mines area was completed. A report on the Magdalena district, nearly completed, will be published by the Survey. A paper on the subject of potash in general, with special emphasis on New Mexico-Texas Permian deposits and development, will be published by the Texas Bureau of Economic Geology, and one on the Permian formations of the Pecos Valley, New Mexico and Texas, was submitted to the American Association of Petroleum Geologists.

New York.—Further field investigations were made of the gas resources and geologic structure of the Greenwood, Hornell, Woodhull, and Wellsville quadrangles, south-central New York, and of gas resources and structure of fields in western New York that produce gas from the Medina sandstone. The report on the structure and gas possibilities of south-central New York was under way. Additional studies were made of the geology of the Millbrook quadrangle, New York-Connecticut, and a field study was made of the stratigraphy and fossil flora of the Genesee shale and Genundewa limestone in western New York.

North Carolina.—Studies of Miocene and Pliocene deposits were continued, and a paper on some deep wells near the Atlantic coast in the Carolinas and Virginia will be published as Professional Paper 186-I in the Survey's series of Contributions to General Geology. Gold investigations in North Carolina are mentioned under Southern Appalachians.

North Dakota.—A preliminary report on the geology and coal resources of the Minot area was issued as a press memorandum. A more detailed report is in preparation as a Survey bulletin. The Survey's Contributions to General Geology will include a paper on American Cretaceous ferns of the genus *Tempskya* (Professional Paper 186-F). Work on Fort Union fossil plants is mentioned under Montana, and work on fossil conifers under Maryland.

Oklahoma.—Work in the tri-State lead and zinc area of northeastern Oklahoma, southeastern Kansas, and southwestern Missouri included detailed areal mapping and considerable underground mapping of individual mines. Field investigations were made of the petroleum possibilities, structure, and stratigraphy of the Black Knob Ridge and adjacent areas and in the Ouachita Mountains. Reports were in progress on the geology, coal resources, and oil and gas possibilities of the Lehigh district (Bulletin 874-B), on the Wilburton-Howe-Heavener coal area, the geology and fuel resources of the Quinton-Scipio district, the fauna of the Moorefield formation, the fauna of the Sycamore limestone, and the flora of the coal fields of eastern Oklahoma. Papers on the correlation of the Bluejacket sandstone and the stratigraphy of the Arkansas-Oklahoma coal

basin have been submitted for publication in the *Bulletin of the American Association of Petroleum Geologists*.

Oregon.—A bulletin on the metalliferous deposits of the Cascade Range is in preparation for Survey publication.

Pennsylvania.—Reports are in preparation on the geology and mineral resources of the Honeybrook and Phoenixville quadrangles and on the York and Hanover quadrangles, the latter in cooperation with the Pennsylvania Survey. A paper on the study of regional metamorphism in the Lower Kittanning coal beds of western Pennsylvania is also in preparation for Survey publication.

South Carolina.—Studies of the Pliocene and Pleistocene material along the intracoastal canal were made and a paper prepared for publication. The investigation of clays in South Carolina will be incorporated in a bulletin on clays of the Southern States to be issued by the Survey. Gold investigations in South Carolina are mentioned under Southern Appalachians.

South Dakota.—The collection of field data for the revision of the geologic map of South Dakota was completed and the first draft of the map was submitted for editing.

Southern Appalachians.—A report on the gold deposits of the southern Appalachians is in preparation for Survey publication. This includes areas in Virginia, North Carolina, South Carolina, Georgia, and Alabama, field work for which was done under a Public Works Administration allotment (Federal projects 158, 165, 174, 176, and 183). The results of brief field investigations made this year in Franklin and Stanley Counties, N. C.; Lancaster and Chester Counties, S. C.; and the Dahlonega district, northern Georgia, will be included in the report.

Tennessee.—Assistance was rendered to the Tennessee Valley Authority in examination of marble deposits and iron ores of the Norris Basin and inspection of dam sites of southeastern Tennessee. A preliminary report on bleaching and ceramic clays of Tennessee was included in a press notice on clays in Kentucky and Tennessee. Further details will be included in a Survey bulletin on clays in the Southern States.

Texas.—A report on stratigraphic, structural, and paleontologic studies of the Pennsylvanian and Permian rocks of north-central Texas was sent to the Texas Bureau of Economic Geology for publication. A monograph on the Navarro fauna and reports on the brown iron ores of eastern Texas, the Shafter silver district, the Terlingua quicksilver district, and the geology of the southern Guadalupe Mountains were in progress. Papers on stratigraphic relations of the Austin, lower Taylor, and related formations in Texas (Professional Paper 186-G); a redescription of Roemer's Paleozoic types from Texas (Professional Paper 186-M); and new Upper Cretaceous Ostreidae from the Gulf region (Professional Paper 186-A) were submitted for the Survey's Contributions to General Geology. Field work was continued in a study of the stratigraphic geology of the Sierra Diablo. Potash work is mentioned under New Mexico. A description of the clays of the San Antonio area will be included in the report on clays in the Southern States.

Utah.—In the early part of the fiscal year a field study of the coal resources and oil and gas possibilities of the Hanksville-Cainsville district was begun, and in the spring of 1936 this study was extended to include the structure, igneous rocks, mineral resources, and physiography of the adjoining Henry Mountains. Some additional work was done in the Randolph quadrangle for the purpose of bringing up to date a report on the geology and mineral resources of this quadrangle begun some time ago. Reports were in preparation on the geology and structure of southeastern Utah, the geology of the area between the Green and

Colorado Rivers in Grand and San Juan Counties, a geographic and geologic reconnaissance of southwestern Utah, and the Bull Valley iron-ore area. A descriptive text for the back of the topographic map of the Zion National Park was prepared. A paper on the geologic structure of southeastern Utah was submitted to the American Association of Petroleum Geologists for publication and one on new light on the orogenic history of central Utah was published by Science. A report on the Cottonwood-American Fork mining district was completed and has been forwarded for editing and publication.

Vermont.—A study of the metamorphic rocks in eastern Vermont, in cooperation with the Geological Society of America, was under way. Work was begun on the granites in connection with a study of the granites of New England.

Virginia.—Reports are in preparation on zinc deposits of southwestern Virginia and the origin of titanium deposits. A preliminary report on the gold deposits of the Virginia Piedmont was submitted for publication by the State. A paper on mineralization of the Virginia titanium deposits was published by the American Mineralogist, and another on the relation between structure and ore deposition in the Roseland titanium district was published by the National Research Council. Work on gold is mentioned under Southern Appalachians.

Washington.—Field work on the areal geology and mineral deposits of the Metaline quadrangle, Pend Oreille County, was begun late in the fiscal year.

West Virginia.—A field study was made of the coals in the Kanawha, New River, and Pocahontas fields. A report on manganese deposits of eastern West Virginia was published by the West Virginia Geological and Economic Survey.

Wyoming.—Field studies of the petroleum and coal resources of the Ishawooa-Pitchfork area, in Park and Hot Springs Counties, the geology and mineral resources of the Afton quadrangle, and the physiography and glacial geology of parts of Park County were in progress. Work in the Randolph quadrangle is mentioned under Utah. A report on the structure and stratigraphy of the Black Hills rim is in preparation.

WORK IN CHEMISTRY AND PHYSICS

Borderland problems involving geology, chemistry, and physics have been given increasing attention. Chemical analyses are made to determine the composition of rocks, ores, and minerals, and physical tests involve measurements of temperature, strength, optical behavior, and many other physical properties; but the most valuable results in geology are obtained by correlating all the factors involved in each particular problem. Thus ores are analyzed chemically not only to determine their metal content but to aid the geologist in the interpretation of their origin and concentration; deep-well temperatures are studied to aid in determining the previous history of the strata and to throw light on the physical conditions under which earth processes take place; the atomic structure of minerals is studied to explain their action in affecting natural waters, oil, and ore-forming solutions.

Among materials analyzed in the laboratory during the year were clays from South Carolina and other States, bauxite from Arkansas, phosphate rock from Florida, igneous rocks, mainly from western

mining districts, bentonite from several States, iron ore from Alabama, mercury ore from Texas, garnet from Georgia, arseniosiderite from California, hornblende and ankerite from Georgia, phlogopite from North Carolina, topaz and chloritoid from South Carolina, uraninite from Idaho, and xenotlite from Mexico. Experiments were made to explain the origin of magnesite deposits, and spectrographic tests were made on different minerals, concentrates, and coals.

During the year 5,081 examinations or tests of minerals and rock samples were made, compared with 4,236 in 1935. These included 1,063 specimens tested and identified for persons not officially connected with the Survey, 1,225 chemical analyses made for geologists in aid of general geologic projects, and 678 similar analyses made in connection with studies of methods of analysis and geochemical investigations relating to the formation and alteration of minerals under natural conditions. The remaining 2,115 tests related to core samples, well cuttings, and other samples.

Among the more important items of work in physics were the testing of activable clays in Mississippi and Alabama, two deposits of which are being developed commercially, largely as a result of the tests made in the Survey laboratory. Geothermal surveys of deep wells were made in New York, Pennsylvania, West Virginia, Alabama, Mississippi, Oklahoma, Arkansas, New Mexico, and California. Two wells tested in California had reached depths of more than 9,000 feet and temperatures considerably above the boiling point of water at sea level. The physical properties of serpentine from several localities were studied to explain its origin and uses. Several classes of geologic data were subjected to correlation and elaborate mathematical discussion.

The following papers were completed during the year:

Adsorption and pycnometry (Journal of the Washington Academy of Sciences).
Monticellite from San Bernardino County, Calif., and the monticellite series (American Mineralogist).

Volcanological boron compounds (Transactions of the American Geophysical Union).

Rock temperatures and depths to normal boiling point of water in the United States (American Association of Petroleum Geologists).

Tables of temperature, geothermal gradient, and age of a nonradioactive earth (Bulletin of the Geological Society of America).

Nephelometric determination of fluorine (Industrial and Engineering Chemistry).

Tests of some chemical reagents for lead (National Research Council).

Sodium carbonate and sodium sulfate (American Institute of Mining and Metallurgical Engineers).

Acid and base—their role in history, geology, health, and industry.

ALASKAN BRANCH

The work of the Geological Survey in Alaska is directed primarily toward aiding in the development of the mineral resources of the Territory and involves field examinations of the various factors that pertain to the character, distribution, and development of these resources, and laboratory and office studies by which these field observations are analyzed and the results made available to the public through reports, maps, and other media. In addition to the funds regularly appropriated by Congress for this work, a small balance remaining from funds previously granted through the Public Works Administration was utilized in completing the compilation and publication of maps of portions of southeastern Alaska under Federal project 69. The work of the branch, in addition to serving the prime purpose of assisting in the development of the mining industry, is used extensively by Government organizations engaged in other special fields of investigation within Alaska, such as the Forest Service, the Alaska Road Commission, and the Biological Survey. The Survey's maps of Alaska are indispensable in any enterprise concerned with the development of the Territory.

Manuscripts and publications.—During the year four reports and four maps (one a reprint) have been published. In addition 13 manuscript reports, including maps, and 1 separate manuscript map have been completed by the authors and are in various stages of critical review, proof, or preparation for publication. One map is in press. At the end of the year four manuscript reports and four maps were partly completed.

Work of the year.—In addition to the routine duties, seven principal projects involving new field work were carried on during the season of 1935. The field projects included five that were principally geologic and two that were primarily topographic. The geologic projects involved field work in the Alaska Range region, east of the Richardson Highway and north of Slana; the central and southern part of Kodiak Island; and the Tikhik Lake district of southwestern Alaska; a general study of the permanently frozen ground as affecting mining developments in central and western Alaska, especially in the Fairbanks and Nome districts; and a general study of recent mining developments in the larger camps adjacent to the Alaska Railroad, the Yukon River, and Seward Peninsula. The topographic projects included the continuation of surveying and mapping in the Admiralty Island area of southeastern Alaska, west of Juneau, and in the Alaska Range region, especially in the Tok Valley and adjacent parts of the Tanana region.

Two projects not directly involving new field work were the continuation of the compilation of drainage maps of portions of southeastern Alaska from airplane photographs taken by the Navy Department and the annual canvass of the production of mineral commodities.

In order to utilize effectively the short open season, the Geological Survey parties usually begin work in the spring as early as climate and other conditions permit. The beginning of work in the field season of 1936 was somewhat delayed owing to the late passage of the appropriation act carrying funds for this work. However, one party left for the field late in April and most

of the others in May, and at the end of the fiscal year these parties were out of touch by ordinary means of communication, so that it is not practicable to give here more than a summary of the work that it is expected they will accomplish.

Seven field projects have been authorized for the season of 1936, and their completion, with the essential office work, will occupy all the time until the spring of 1937. These projects include four geologic investigations, two topographic mapping projects, and the usual study in the field of mining conditions and mineral production of the Territory. The four geologic projects include a continuation of the investigation of the geologic features and mineral resources of part of the Alaska Range lying near the head of the Copper River and forming part of the watershed between the river and tributaries of the Tanana River; investigations of mining developments and mineral production in the principal placer camps of the upper Yukon, including Eagle, Circle, Fortymile, and adjacent areas; a study of the principal mining camps adjacent to the Alaska Railroad in central Alaska; and investigation of the mineral resources of the Glacier Bay area, including Glacier Bay National Monument, southeastern Alaska. The two topographic field projects include the continuation of surveying and mapping in the Admiralty Island area of southeastern Alaska, west of Juneau, and in the Alaska Range region, especially in the vicinity of the Robertson and Gerstle Rivers.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

The status of topographic surveys shows that the country as a whole is now 47.1 percent mapped, the year's increment amounting to 0.4 percent. The area covered by topographic base maps without contours, prepared from aerial photographs after field examination, was largely increased.

FIELD SURVEYS

Abbreviations for projects used below: Federal Emergency Administration of Public Works, "P. W."; Tennessee Valley Authority, "T. V. A."; Federal Emergency Relief Administration, State projects, "F. E. R. A." Cooperation with States was continued in about the same amount as in recent years.

Alabama.—Mount Hope 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Iuka, Allsboro, Burleson, Gravelly Springs, Barton, Belgreen, Muscle Shoals, Erin, Tuscumbia, Russellville, Haleyville, Rogersville, Town Creek, Mount Roszell, Hillsboro, Danville, Veto, Decatur, Hartsells, Hazelgreen, Talucah, Oleander, Plevna, Gurley, Guntersville, Snead, Blountsville, Larkin, Larkinsville, Albert-

ville, Attalla, Fackler, Hollywood, Portersville, Keener, Long Island, and Valley Head 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Mount Hope 15' quadrangle (T. V. A.).

Arizona.—Payson No. 3 15' quadrangle and Grand Canyon National Monument (P. W.) completed and Payson No. 4 15' quadrangle (P. W.) begun. Summit Valley No. 4 15' quadrangle completed at request of Forest Service.

Arkansas.—Caddo Gap No. 1 and Caddo Gap No. 2 15' quadrangles (P. W.), and North Little Rock No. 4 7½' quadrangle (P. W.), completed.

California.—In cooperation with the county surveyor of Los Angeles County, Mount Emma, Alder Creek, Mount Gleason, and Trail Canyon 6' quadrangles completed; Crystal Lake, North Baldy, Pine Mountain, and Mount Waterman 6' quadrangles begun. In cooperation with the State engineer of California, Sebastopol 15' quadrangle and San Bernardino No. 1 and San Bernardino No. 2 7½' quadrangles completed; Tobias Peak 30' quadrangle continued and San Bernardino No. 4 7½' quadrangle begun. In preparation for geologic mapping Kreyenhagen Hills 7½' quadrangle completed. Burney and Paynes Creek 30' quadrangles (P. W.) completed.

Colorado.—In cooperation with the city of Denver, mapping without contours from aerial photographs begun for East Denver 2c, East Denver 3b, West Denver 1d, and West Denver 4a 7½' quadrangles. Leadville No. 3 15' quadrangle (P. W.) completed; Leadville No. 2 and Buena Vista No. 2 15' quadrangles and Chattanooga mining area (P. W.) begun.

Connecticut.—Montville 7½' quadrangle (P. W.) completed.

Delaware.—Wilmington and vicinity (P. W.) completed.

Florida.—Villa Tasso, Holley, and Point Washington 15' quadrangles (P. W.) completed.

Georgia.—Thomaston 15' quadrangle (P. W.) completed. East Ridge 7½' quadrangle (T. V. A.) begun. Mapping without contours from aerial photographs completed for 7½' quadrangles within Rock Spring, Sugar Valley, Spring Place, Burton, Rabun Gap, Rossville, Trion, Long Island, and Valley Head 15' quadrangles (T. V. A.).

Idaho.—Borah Peak 30' quadrangle (P. W.) completed; Yellow Pine No. 2 and Washington Creek No. 2 15' quadrangles (P. W.) continued, and Logan No. 3 15' quadrangle (P. W.) begun. For the Forest Service, Mackay 30 quadrangle completed. At the request of the Office of Indian Affairs, Pocatello No. 2 15' quadrangle was begun.

Illinois.—Delavan, Keithsburg, and Miles 15' quadrangles completed; Mount Carroll, Shelbyville, Lena, and Stewardson 15' quadrangles continued; Savanna, New Douglas, Tuscola, and Elizabeth 15' quadrangles begun in cooperation with the Department of Registration and Education of Illinois, Geological Survey. Lovington, Arcola, Pontiac, and Watseka 15' quadrangles (P. W.) completed and Ashmore 15' quadrangle (P. W.) begun.

Indiana.—Oolitic 15' quadrangle (P. W.) completed.

Kentucky.—Horse Cave 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Paducah, Viola, Mayfield, Benton, Smithland, Murray, Eddyville, Golden Pond, and Blood 15' quadrangles (T. V. A.).

Louisiana.—The Louisiana Board of State Engineers cooperating, mapping without contours from aerial photographs completed for 7½' quadrangles within Santo, Bond, Mamou, Fenton, Simmons, De Quincy, Hecker, Nezpique, Aubrey, Glenmora, Kipling, and Rena 15' quadrangles.

Maine.—St. Croix 15' quadrangle and Acadia National Park (P. W.) completed. Mars Hill 15' quadrangle completed.

Maryland.—Leonardtown 15' quadrangle (P. W.) completed.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, Mount Toby, Williamsburg, Scituate, 7½' Duxbury, Shirley, Pocasset, Cohasset, Abington No. 2, Whitman, Hanover, Nantasket, Greenfield No. 1, and Greenfield No. 4 7½' quadrangles completed. Boston Bay, No. 3, Warwick No. 2, Warwick No. 3, Dedham No. 1, and Dedham No. 2 7½' quadrangles begun. Millbury and Ayer 7½' quadrangles (P. W.) completed.

Michigan.—In cooperation with the State Highway Department of Michigan, mapping without contours for aerial photographs begun for 7½' quadrangles within Rochester, Mount Clemens, Hicky, Armada, Port Huron, Almont, Milford, and Pontiac 15' quadrangles. Ithaca and Cement City 15' quadrangles (P. W.) and Berkey 7½' quadrangles (P. W.) completed, and Swanton No. 2 7½' quadrangles (P. W.) begun.

Minnesota.—Rochester 15' quadrangle (P. W.) completed.

Mississippi.—Edwards 15' quadrangle (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Burnsville, Candler, Iuka, Allsboro, and Burleson 15' quadrangles (T. V. A.).

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri, Ava, Herman No. 3, Thornfield, Kearney, and Barry 15' quadrangles and Butler 3d 7½' quadrangle completed; Franks, Edgar Springs, Big Piney, Fielden, Richland, Buffalo, Fordland, Long Lane, Protom, and Niangua 15' quadrangles and Knobnoster No. 4 7½' quadrangle continued; Independence No. 1, Springfield No. 3, Knoblick, Bradleyville, Vienna, Middlebrook, Bolivar No. 2, Warsaw No. 3 S½, Hannibal, and Louisiana No. 4 15' quadrangles and Springfield 3b 7½' quadrangle begun; and cultural revision completed for Alton SW., St. Charles SW., and St. Charles SE. 7½' quadrangles. Warsaw 1d, Warsaw 1c, Warsaw 2d, Warsaw 3a, Warsaw 4a, Warsaw 4b, Gravois Mills No. 3, Eldon No. 3, Versailles 3b, and Liberty 7½' quadrangles (P. W.) completed and Warsaw 2c and Warsaw 3b 7½' quadrangles (P. W.) begun. Morrison and Sullivan No. 2 15' quadrangles (F. E. R. A.) completed.

Montana.—Jennings 30' quadrangle (P. W.) completed and Silver Tip 30' quadrangle (P. W.) begun. Dupuyer No. 3 15' quadrangle completed for the Office of Indian Affairs.

Nebraska.—Seward No. 4 15' quadrangle (P. W.) completed.

Nevada.—Gold Creek No. 4 15' quadrangle and Comstock Lode district (P. W.) completed. At the request of the Forest Service, Gold Creek No. 1 15' quadrangle completed and Gold Creek No. 2 15' quadrangle begun.

New Hampshire.—Whitefield (P. W.) and Lovewell Mountain 15' quadrangles completed.

New Jersey.—Weehawken, Ramapo No. 2 and Ramapo No. 3 7½' quadrangles (P. W.) completed.

New Mexico.—Hillsboro Peak No. 1 and Arabela No. 4 15' quadrangles (P. W.) completed. In preparation for geologic mapping Queen No. 3 quadrangle completed.

New York.—Poughkeepsie 15' quadrangle continued, West Point 15' and Tarrytown 1 7½' quadrangles begun, in cooperation with the Department of Public Works of New York. Chenango Forks, 7½' Binghamton, Gansevoort, 7½' Schuylerville, Fort Miller, Corinth, and Weehawken 7½' quadrangles (P. W.) completed.

North Carolina.—Farner 15' quadrangle (P. W.) completed; Blowing Rock 15' quadrangle (P. W.) continued. Mapping without contours from aerial photographs completed for 7½' quadrangles within Robbinsville, Cullasaja, Caesars Head, Democrat, Edneyville, Tigersville, Bushnell, Wayah Bald, Le

Conte, Bryson, Cataloochee, Fines Creek, Waynesville, Halewood, Biltmore Arden, Farner, Hot Springs, Newport, and Limestone 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Haw Knob 15' quadrangle (T. V. A.).

North Dakota.—Dunseith and Kempton No. 2 15' quadrangles (P. W.) completed, McVile 15' quadrangle (P. W.) continued, and Alcide 15' quadrangle (P. W.) begun.

Ohio.—In cooperation with the county commissioners of Lucas County, Whitehouse, Berkey, Grand Rapids, Swanton No. 2, Swanton No. 3, and McClure No. 2 7½' quadrangles completed. Tontogany, Reno by the Lake, Walbridge, and Genoa 7½' quadrangles (P. W.) completed.

Oregon.—Disston 30' quadrangle, Crater Lake National Park, and Squaw Butte ranch (P. W.) completed. At the request of the Forest Service, Crescent 30' quadrangle completed.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, Sheffield, Kinzua, and Mount Jewett 15' quadrangles completed. Loleta, Mattawana, and Slatington 15' quadrangles begun. Allensville, Hawley, Needmore, and Steubenville 15' quadrangles (P. W.) completed.

Rhode Island.—East Providence and Providence No. 1 7½' quadrangles (P. W.) completed.

South Carolina.—Mapping without contours from aerial photographs begun for 7½' quadrangles within Woodford, Spartanburg, Hopkins, Sumter, Edmund, Rimini, Cowpens, St. Matthews, and Elloree 15' quadrangles (F. E. R. A.).

South Dakota.—Oacoma No. 2 15' quadrangle (P. W.) completed.

Tennessee.—Farmer 15' quadrangle (P. W.) completed. Conasauga No. 1 and Conasauga No. 2 7½' quadrangles (T. V. A.) begun. Mapping without contours from aerial photographs completed for 7½' quadrangles within Sequatchie, Pikeville special, Dayton, Apison, Allardt, Spring City, Texas Knobs, Blue Spring, Niota, Conasauga, Vonore, Greenback, Log Mountain, Middlesboro, Straw Plains, Sevierville, Tate Springs, English Mountain, Rogersville, Midway, Hot Springs, Fall Branch, McEwen, Bold Spring, Dark Mills, Selmer, Puryear, Hollow Rock, Wildersville, Warrens Bluff, Right, Adamsville, Faxon, Zach, Holladay, Darden, Saltito, Gillises Mills, Model, Tennessee Ridge, Waverly, Bakerville, Beardstown, Flatwoods, Lutts, Hohenwald, Allens Creek, Iron City, Dickson, Hampshire, Summertown, Pleasant Point, Blood, Fernvale, Lynnville, Minor Hill, Franklin, Groveland, Culleoka, Aspen Hill, Nolensville, Eagleville, Talley, Harms, Bellbuckle, Haley, Elora, Hollow Springs, Tullahoma, Decherd, Smartt, Pelham, Mont Eagle, Altamont, Jasper, Duniap, Lookout Mountain, Mayland, Crossville, Deer Lodge, Roddy, Annadel, Harriman, Huntsville, Oliver Springs, Wheat, Farner, La Follette, Coal Creek, Friendsville, McLean Rock, Corryton, Shooks, Walland, Rutledge, Townsend, Newport, Limestone, and Hazelwood 15' quadrangles (T. V. A.) and begun for 7½' quadrangles within Centerville and Haw Knob 15' quadrangles (T. V. A.).

Texas.—Sanford and Longview No. 2 15' quadrangles (P. W.) completed.

Utah.—Elk Ridge and Theodore 30' quadrangles (P. W.) completed.

Vermont.—In cooperation with the State geologist of Vermont, Woodsville 15' quadrangle completed. Lyndonville and Whitefield 15' quadrangles (P. W.) completed.

Virginia.—Charlottesville and Burkes Garden 15' quadrangles, Glen Allen and Midlothian No. 4 7½' quadrangles, and Charlottesville and vicinity completed, and Speedwell and Gerrardstown 15' quadrangles begun in cooperation with the Conservation and Development Commission of Virginia, Geological

Survey. Amherst and Vesuvius 15' quadrangles (P. W.) completed. Mapping without contours from aerial photographs completed for 7½' quadrangles within Middlesboro 15' quadrangle (T. V. A.).

Washington.—In cooperation with the Department of Conservation and Development, Marcus 30' quadrangle continued, Yakima No. 3 and Yakima No. 4 15' quadrangles and Kittitas reclamation project begun. Newport 30' quadrangle continued at the request of the Forest Service.

West Virginia.—Cultural revision completed for Steubenville 15' quadrangle (P. W.).

Wisconsin.—Osseo 15' quadrangle (P. W.) completed and Arkansas 15' quadrangle (P. W.) continued.

Wyoming.—Big Piney, La Barge, and Cokeville N½ 30' quadrangles (P. W.) and Grand Teton National Park completed. In preparation for geologic mapping, Cokeville S½ 30' quadrangle begun.

WATER-RESOURCES BRANCH

SUMMARY

The importance of water and of systematic records related to the quality, chemical quality, and availability of both surface and ground waters becomes increasingly greater each year. The growth of the country in population and industry, with consequent increases in demands for water, and especially the continued series of dry years that included the disastrous and widespread drought of 1934, the current drought of 1936, apparently of rivaling intensity, and the dust storms that have continued in large areas of the central West, have impressed on the people the controlling importance of water in surface streams and in underground basins in relation to many of man's activities. The information collected by the Geological Survey is used extensively by many Federal, State, and private agencies. The Public Works Administration, the National Resources Committee, and related activities have found the Survey records and information with respect to water to be invaluable in studies of projects of all classes and in all sections of the country and have relied on these basic data for determining action on many projects.

Reliable information with respect to supplies of water, both on the surface and in the ground, and to their fluctuations with variations in rainfall, is essential to orderly, sound, and economic development along many lines, as in domestic water supplies, irrigation, flood protection, control of pollution, recreational uses, and water-power development. The work of the water-resources branch thus occupies a position of great importance in the economic affairs of the Nation.

The investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other gov-

ernmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations of ground and surface water and of the quality of water were conducted, through advance, transfer, or repay of funds, for the following Federal bureaus:

Department of Agriculture:

Bureau of Biological Survey.

Bureau of Plant Industry.

Soil Conservation Service.

Weather Bureau.

Department of Commerce: Bureau of Fisheries.

Department of the Interior:

Office of Indian Affairs.

Bureau of Mines.

Bureau of Reclamation.

Division of Grazing.

National Park Service.

Petroleum Conservation Division.

Department of Justice: Bureau of Prisons.

Department of State.

Federal Power Commission.

National Resources Committee.

Resettlement Administration.

Tennessee Valley Authority.

Veterans' Administration.

War Department: Office of Chief of Engineers.

States.—Amounts aggregating \$587,354.80 were made available by States and municipalities for cooperative surface- and ground-water investigations. In addition to the data obtained as a result of this cooperation, it is estimated that other data valued at over \$114,000 were furnished by individuals and other organizations.

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the Commission to perform such field work as may be assigned to them by the Commission. The operation of about 290 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 111 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operation under permits and licenses of the Federal Power Commission in connection with 145 projects.

WORK OF THE YEAR, BY DIVISIONS

The division of surface water conducts investigations of surface water, which consist of the measurement of the flow of rivers, conducted in the 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and records of stage and other data are collected; from which the daily discharge of the rivers is computed. In this work 44 States, the Territory of Hawaii, several Federal bureaus, and several individuals

cooperated in the maintenance of the 3,163 regular gaging stations that were in service at the end of the year. Records for about 114 additional gaging stations were received, ready for publication, from Federal bureaus and from individuals. There were 42,157 regular and miscellaneous discharge measurements made during the year.

The division of ground water investigates the waters that lie below the surface in the zone of saturation (from which the wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are generally published in water-supply papers that include maps showing the ground-water conditions. The investigations relating to the chemical composition of the water are made in cooperation with the division of quality of water. Projects involving large expenditures for wells to develop water supplies are considered each year by the several departments of the United States Government, and the ground-water division is called upon to furnish information and advice on many of these projects. During the fiscal year work was done in 21 States and Hawaii, in cooperation with 13 States or local governmental agencies, the Territory of Hawaii, and other Federal bureaus.

The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as such use is affected by the dissolved mineral water. The analysis (partial or complete) of 1,481 samples of water, including some for many of the studies of ground water in the different States and for most of the special investigations on water supplies for specific projects, was completed during the year. Close cooperation was continued with the division of ground water in the study of problems relating to quality of ground water and the preparation of the parts of ground-water reports that involve consideration of the chemical character of the waters.

The work of the division of power resources comprises the preparation of monthly and annual reports on the production of electricity for public use and the consumption of fuel in generating the electricity reported. The monthly reports also include, through cooperation with the Bureau of Mines, comparative figures of the stocks of bituminous coal and anthracite on hand at electric public utilities, comparison of the monthly consumption of coal, and the number of days' supply of

bituminous coal and anthracite on hand at the current rate of consumption. The annual report for 1935 contains revised figures of the monthly production of electricity and consumption of fuel previously published in the monthly reports, a summary of the annual reports from 1919 to 1935, the average annual rate of consumption of coal and the coal equivalent of oil and gas in generating 1 kilowatt-hour of electricity from 1919 to 1935, and the annual exports and imports of electricity between the United States and Canada and Mexico for certain years. A report on the capacity of water wheels in the United States on January 1 was also prepared. The final report of the monthly and annual production of electricity for public use in 1935 was released April 2, 1936. The annual report on the capacity of water wheels in water-power plants in the United States was released January 31, 1936. The collection, compilation, and publication of the monthly and annual reports of the production of electricity for public use that have been carried on by the Geological Survey since 1919 will be transferred to the Federal Power Commission July 1, 1936.

The division of water utilization investigates problems affecting the utilization and control of the waters of streams, makes studies for the interpretation of records of stream flow, and performs administrative work relating to supervision and investigation of these problems and to activities conducted by the field organization of this branch pertaining to power projects of the Federal Power Commission and of the Interior Department. The field work is generally conducted by personnel otherwise assigned to the division of surface water. In collaboration with the Mississippi Valley Committee of the Public Works Administration, and with the assistance of special advisory committees of the American Society of Civil Engineers and the American Geophysical Union, studies were made of floods in the United States, with especial reference to their magnitude and frequency, and of the relations of rainfall and run-off in the United States, and the results were published during the year in Water-Supply Papers 711 and 772. The favorable reception of these two reports indicates that they have filled a need. The division has been active during the year in investigations of water problems along the international boundary between the United States and Canada for the State Department, and also in the organization of the collection of information on recent outstanding floods.

CONSERVATION BRANCH

The regular work of the conservation branch was severely handicapped during the fiscal year by lack of funds. Many inspections of operations were omitted, and loss in resources and in royalties has

resulted. Up to the end of the year 850 proposed unit plans of development and operation had been submitted by Federal oil and gas permittees for technical review and revision in compliance with departmental requests. This review made necessary the temporary assignment in Washington of field engineers at a sacrifice of field personnel for regular duties. Detail of personnel for Public Works operations in connection with river-utilization surveys, plugging wells, and general rehabilitation has also retarded the normal functions of the branch, but has made it possible to retain a highly trained staff of engineers and scientists, who will resume more nearly normal operations in the fiscal year 1937.

MINERAL-CLASSIFICATION DIVISION

The work of the mineral-classification division was restricted, as in previous years, largely to office procedure, delayed in part by lack of geologic information due to limited field investigations. The mineral-classification activities of the division were further directed to compliance with the assignment of the responsibility for determining the areas subject to logical unitization under plans for unit or cooperative development submitted by holders of Federal oil and gas prospecting permits and leases. The only formal mineral classification completed involved the classification of 317,766 acres in southern Washington County, Utah, as nonoil in character. Coal lands in Valencia County, N. Mex., amounting to 4,962 acres, were restored from coal-land withdrawal. Action was taken on 500 requests for information as to the mineral character of the land, 748 applications for mineral permit, and 147 applications for mineral lease, involving technical action; consideration was given to 1,176 assignments, coal-permit extensions, lease and license authorizations; 105 decisions were prepared for a departmental committee affecting extensions of oil and gas prospecting permits and potash permits; and 731 permits involved in plans for cooperative unit operation and development for oil and gas fields or areas were considered. Technical reports were submitted on 1,167 requests for classification as to oil; 90 right-of-way applications were reviewed as to interference with coal, oil, gas, potash, and other mineral deposits; and reports were made on 143 requests for oil-development status of Government lands. In all, 4,810 cases requiring technical consideration were disposed of in the mineral-classification division during the year.

In addition, definitions of the "known geologic structure" of 13 producing oil and gas fields were prepared and promulgated as follows:

Definitions of "known geologic structure", fiscal year 1936

State	Field	Date promulgated	Area (acres)
Colorado.....	Iles.....	Aug. 5, 1935	1, 710
Montana.....	Cedar Creek (revision).....	Sept. 21, 1935	122, 323
New Mexico.....	Lea (revision).....	Sept. 6, 1935	1, 281
	North Lea.....	do.....	1, 200
	Northwest Lea.....	do.....	1, 560
North Dakota.....	Cedar Creek.....	Sept. 21, 1935	27, 013
Wyoming.....	North Baxter Basin.....	Nov. 14, 1935	7, 031
	South Baxter Basin (revision).....	do.....	15, 463
	Hidden dome (addition).....	Nov. 16, 1935	280
	North Oregon Basin (revision).....	Dec. 9, 1935	4, 632
	South Oregon Basin (revision).....	do.....	7, 418
	East Lance Creek field (revision).....	Mar. 3, 1936	800
	Lance Creek field (revision).....	do.....	5, 593

The area of outstanding definitions of the "known geologic structure" of producing oil and gas fields on June 30, 1936, amounted to 1,154,447 acres in California, Colorado, Montana, New Mexico, North Dakota, Oklahoma, Utah, and Wyoming.

WATER AND POWER DIVISION

The work of obtaining basic information as to the water-power resources and storage possibilities of public lands and of making it available for use in the administration of public-land laws and by Federal and other agencies engaged in planning, constructing, and operating water-power projects was continued in the field, being made possible by the extended availability of Public Works funds. River-utilization surveys covering 1,615 miles of important streams and tributaries were made in 11 public-land States. Surveys of reservoir and dam sites embracing an area of 520 square miles were also completed. Supplemental geologic and geophysical studies of foundation materials and conditions were made at 16 dam sites.

Office activities included action resulting in the addition of 46,174 acres to outstanding water-power reserves in 13 public-land States and the elimination of 10,934 acres from such reserves in 6 States, with a net increase of the total reserved area in 22 States to 6,500,247 acres. The elimination of 40 acres from reservoir-site reserves left a net total of 133,704 acres withdrawn. Two restorations of lands withdrawn under the act of October 2, 1888, were also made. Field supervision of power projects for the Federal Power Commission involved investigations and reports on 11 projects, supervision of construction and operation on 136 projects, and studies of cost accounting on 4 projects. Field supervision of power projects holding permits and grants from the Interior Department involved 317 projects.

Statistics compiled by the division show that the holders and users of rights-of-way granted by the Secretary of the Interior for power purposes had for the calendar year 1935 an aggregate installed

capacity of 4,861,046 horsepower, including 3,370,401 horsepower at hydraulic plants and 1,490,645 horsepower at fuel plants, and an aggregate energy generation of 7,961,000,000 kilowatt-hours, which is an increase of about 15 percent over the production in 1934. Revenues accrued to the Government from these grants aggregated \$221,166 from 1912 to 1935, and \$15,045 additional has been assessed for the calendar year 1936. Accrued charges for unauthorized occupancy of public lands by power projects prior to the issuance of licenses therefor by the Federal Power Commission amount to \$100,536 additional.

MINING AND OIL- AND GAS-LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions, consisting of inspectional and regulatory supervision of mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves, increased notably in volume and in difficulty of effective performance during the year.

Public lands.—The number of public-land properties under supervision of the oil- and gas-leasing division increased 13 percent, to a total of 8,332 involving 11,832,767.58 acres in 19 States and Alaska. With the aid of funds allotted in 1933 by the Public Works Administration and a similar allotment in the fiscal year 1936, the supervisory force was maintained intact, though available only in part for regular inspectional and regulatory work, and was enabled to accomplish important conservational and remedial results outlined more fully under the heading "Public Works projects."

The work of the oil- and gas-leasing division has been vastly increased, both in Washington and in the field, by the necessity of assisting oil and gas permittees in fulfilling departmental requirements for the submission of unit or cooperative plans of operation and development involving permit acreage, and of reviewing and revising the engineering and royalty features of such plans after their submission. Six engineers from the field offices were temporarily assigned to the Washington office to assist in the review of unit plans, and three geologists from the geologic branch were given temporary assignments to the mineral-classification division of the conservation branch to assist in delineating the areas appropriately subject to unitization under each plan submitted. The act of August 21, 1935 (49 Stat. 674), amending the mineral leasing law, has required revision of all unit plans submitted for areas that can be logically unitized. At the end of the fiscal year 1936 a total of 800 plans of unit or cooperative development for oil or gas pools, fields, or areas involving public land had been filed with the Geological Survey, of which 20 have been finally approved by the Secretary of the Interior, 73 have been reviewed and returned to their proponents

for revision and resubmission, 186 have been rejected or withdrawn, and 521 are awaiting technical consideration in the conservation branch. The oil- and gas-leasing division assisted in formulating regulations under the act of August 21, 1935 (49 Stat. 674). These regulations were approved by the Secretary of the Interior on May 7, 1936.

Drilling activity on public lands during the year included the spudding of 226 new wells and the completion of 314 others, 191 of which were productive of oil or gas and 123 barren. The total number of wells under supervision at the end of the year was 7,456 in 17 States and Alaska, including 3,849 capable of producing oil or gas. The production of petroleum, natural gas, and natural gasoline from public land in 1936 was substantially greater than in other recent years, and the revenues accrued therefrom were materially increased.

The mining division is charged with supervision of all operations for the discovery and development on public lands of deposits of coal, phosphate, sodium, potassium, and oil shale; in New Mexico and Louisiana of sulphur; on certain land grants of gold, silver, and mercury; and on restricted allotted and tribal Indian lands of all minerals except oil and gas. This supervisory and regulatory work during the fiscal year was accomplished through six field offices in Colorado, Montana, New Mexico, Oklahoma, and Utah, and through a cooperative agreement approved May 4, 1935, with the Territory of Alaska Mining Department.

Coal properties under supervision in 14 States and Alaska decreased 64, to 694; potash properties in 8 States decreased 109, to 95; sodium properties in 7 States decreased 5, to 40; sulphur properties in 1 State remained at 26. The number of phosphate properties increased by 1, to 9, and the oil-shale lease remained at 1 in 1 State. The total number of properties under supervision was 865, a decrease of 177. The reduction in coal properties resulted from the Secretary's instructions of January 24, 1934, and that in potash properties from the Secretary's orders 799, 817, 854, and 914. In prospecting for the above-named minerals 12 bore holes were drilled during the year.

Accidents to employees working in mines under departmental leases are generally fewer than in competitive mines not on Government lands, and it is gratifying to note that of the 51 awards made to bituminous mines or to operators by the Joseph A. Holmes Safety Association for the calendar year 1935 two were made to departmental lessees, and one was made to one of the two potash mines in operation in America. The use of safety appliances and safety clothing is increasing generally throughout mines on Government lands.

Indian lands.—On behalf of the Office of Indian Affairs technical supervision of mineral development was continued in 1936 on tribal and restricted allotted lands within the limits of numerous Indian reservations. Oil and gas supervision involved 5,583 leaseholds, 4,356 wells, and aggregate royalty and rental accruals of \$2,652,897.70 for Indian beneficiaries in 8 States and in 28 different tribes and included royalty accounting for certain agencies, appraisals of bonus and royalty offers and of pollution damages, assistance to lessees of Indian land on operating problems and in the preparation of unit plans of development, and assistance to agency officials and tribal councils on technical phases of leasehold development and administration.

Mining supervision involved 36 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of \$360,-727.69, an increase of 74.7 percent from the preceding year; 56 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes lands in Oklahoma, with an aggregate production increased from 465,780.95 tons in 1935 to 568,725.92 tons in 1936, and revenue accruals from royalties, bonuses, and sale of coal lands amounting to \$73,798.97; 1 asphalt lease involving segregated Choctaw and Chickasaw lands in Oklahoma; 1 lime-phosphate lease involving restricted allotted Five Tribes land in Oklahoma; and 53 properties in other States, 18 of which are agency mines. It included also special investigations of 21 properties for minerals other than fuels.

Naval petroleum reserves.—On behalf of the Navy Department supervision was continued during the year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Naval Petroleum Reserve No. 3, in Wyoming. Production from the California reserves aggregated 3,777,607.53 barrels of petroleum, 2,903,396 M cubic feet of natural gas, and 12,248,006.08 gallons of natural gasoline and had an aggregate royalty value of \$683,256.32. Under a Works Progress Administration allotment of \$9,913, approved September 3, 1935, derricks were repaired, roads were built and repaired, well sites fenced, and fire hazards removed from the California reserves.

PUBLIC WORKS PROJECTS

Under the supervision of the conservation-branch personnel, aggregate expenditures of \$200,902.75 were made during the fiscal year 1936 from funds allotted by the Administrator of Public Works for field investigation in conservation work pertinent to branch functions. On 11 projects \$146,783.76 was expended for river utilization surveys of power and storage resources of important streams in 11 States. On 16 projects \$54,118.99 was expended in 12 States

in the plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands and thereafter improperly abandoned or merely deserted; in extinguishing or controlling coal-outcrop fires and in filling, bulkheading, or otherwise safeguarding abandoned mines or prospective openings on public and Indian lands; and in surface studies of coal occurrence and subsurface studies of oil and gas occurrence in Indian lands in Oklahoma.

SUMMARY OF FIELD ACTIVITIES, BY STATES

Alabama.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Examined 2 tracts in Tuscaloosa County and 1 tract in Walker County for adjudication of conflicting mineral and non-mineral filings and 1 tract in Colbert County for minerals. Supervised 1 lease and 1 prospecting permit for oil and gas, and 1 coal lease.

Alaska.—Supervised 1 power project, 128 prospecting permits for oil and gas, and 2 leases, 2 licenses, and 10 prospecting permits for coal.

Arizona.—Supervised 25 power projects; completed 150 miles of river-utilization surveys on the Gila, Little Colorado, and Verde Rivers and tributaries; and surveyed in detail 140 square miles in 8 dam and reservoir sites. Supervised 76 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land.

Arkansas.—Investigated oil and gas prospecting operations in southeastern Arkansas and in the western part of the Arkansas Valley in aid of mineral classification, and examined for minerals 1 tract in Franklin County. Supervised 1 power project. Supervised 8 prospecting permits for oil and gas.

California.—Investigated occurrence and use of carbon-dioxide gas in Imperial County. Through the geologic branch examined land in the Castac Creek area, Los Angeles County, for purposes of mineral classification. Supervised 92 power projects; completed 335 miles of river-utilization surveys on the American, Kings, Trinity, Carson, and Yuba Rivers and Cache, Clear, and Putah Creeks; surveyed in detail 70 square miles in 16 dam and reservoir sites; and made detailed surveys of 10 dam sites. Supervised 215 leases and 1,160 prospecting permits for oil and gas on public land and 23 leases on naval petroleum reserves. Supervised 3 coal and 12 sodium permits, 1 sodium lease, and 3 potash leases.

Colorado.—Made an areal and structural reconnaissance of land in Archuleta County for purposes of mineral classification. Supervised 12 power projects; completed 41 miles of river-utilization surveys on the Little Snake and Roaring Fork Rivers and tributaries; and surveyed in detail 4 square miles in 2 dam and reservoir sites. Supervised 30 leases and 632 prospecting permits for oil and gas on public land and 6 oil and gas leases on Indian land. Supervised on public land 85 leases, 15 licenses, 49 permits, and 5 awarded lease applications for coal; 1 sodium lease; and 1 potash permit. Supervised on Indian lands 2 agency coal mines.

Florida.—Investigated oil and gas prospecting operations throughout the State and examined 1 tract each in Glades, Jefferson, and Lake Counties for purposes of mineral classification.

Idaho.—Examined land in the Rainy Creek area, Bonneville County, for purposes of mineral classification. Supervised 33 power projects; completed 120 miles of river-utilization surveys on the Coeur d'Alene, Moyie, and Snake

Rivers; and surveyed in detail 2 dam sites. Supervised 76 prospecting permits for oil and gas; 1 lease and 15 permits for coal; and 2 phosphate leases.

Kansas.—Investigated oil and gas prospecting operations in western Kansas in aid of mineral classification. Supervised 18 prospecting permits for oil and gas.

Louisiana.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 11 leases and 1 prospecting permit for oil and gas.

Mississippi.—Investigated oil and gas prospecting operations throughout the State and examined 1 tract each in Greene, Jackson, and Pearl Counties. Supervised 1 prospecting permit for oil and gas.

Montana.—Supervised 34 power projects; completed 40 miles of river-utilization surveys on the Flathead River and its North and South Forks; and surveyed in detail 72 square miles in 2 reservoir sites. Geologic and geophysical examinations were also made at these reservoir sites. Supervised 105 leases and 833 prospecting permits for oil and gas on public land and 43 oil and gas leases on Indian land; 97 leases, 37 permits, and 52 licenses for coal; 6 phosphate leases; 1 potash permit; 2 Indian agency coal mines; and 10 coal leases and 2 silver, lead, and gold leases on Indian land.

Nebraska.—Supervised 1 potash prospecting permit.

Nevada.—Supervised 22 power projects; completed 200 miles of river-utilization surveys on the Carson, Humboldt, Little Humboldt, and Marys Rivers and in Pahrangat Valley; and made detailed surveys of 3 dam and reservoir sites. Supervised 79 prospecting permits for oil and gas, 3 coal permits, 1 phosphate lease, 1 sodium lease, and 7 potash permits.

New Mexico.—Investigated occurrence of carbon-dioxide gas in northeastern and central New Mexico. Examined, for the Indian Service, land in the pueblo of Isleta, Bernalillo County, for the purpose of mineral classification. Initiated an areal stratigraphic and subsurface structural investigation in southeastern New Mexico. Supervised 3 power projects; completed 243 miles of river-utilization surveys on the Pecos and Peñasco Rivers and Rio Chama and tributaries; surveyed 3 washes in the vicinity of Shiprock in connection with erosion studies; and surveyed 28 square miles in 2 dam and reservoir sites. Supervised 149 leases, 4 suspended preference rights, 1,754 prospecting permits for oil and gas on public land, and 7 oil and gas leases on Indian land. Supervised on public land 23 leases and 24 prospecting permits for coal, 12 prospecting permits for sodium, 9 leases and 134 prospecting permits for potash, and 26 sulphur permits. Supervised 1 coal lease on Indian land and 9 Indian agency coal mines.

North Dakota.—Supervised 25 prospecting permits for oil and gas on public land. Supervised 70 leases, 1 permit, and 21 licenses for coal and 1 sodium permit.

Oklahoma.—Investigated oil- and gas-prospecting operations in western Oklahoma, including development in and adjacent to the river bed of the Red River, and examined one tract in Beckham County for purposes of mineral classification. In cooperation with the geologic branch, continued the mapping of the Osage and adjoining Indian lands with special attention to subsurface structure. Supervised 3 power projects, 15 leases and 62 prospecting permits for oil and gas on public land, and 5,495 oil and gas leases on Indian land. Supervised on segregated tribal and restricted allotted Indian lands 32 leases, 17 permits, and 2 temporary mining permits for coal, 1 asphalt lease, 1 lime-phosphate lease, and 1 right-of-way lease; on Quapaw Indian lands, 36 lead and zinc leases.

Oregon.—Supervised 40 power projects; completed 150 miles of river-utilization surveys on the Applegate, Hood, Luckiamute, and Santiam Rivers, the

Middle Fork of the Willamette River, and Cow, Evans, Jump-Off Joe, Little Butte, and Mud Creeks; surveyed in detail 84 square miles in 10 dam and reservoir sites; and made detailed surveys of 3 dam sites. Supervised 122 prospecting permits for oil and gas on public land, 1 lease and 1 permit for coal, 2 sodium permits, and 1 oil-shale lease.

South Dakota.—Supervised 53 prospecting permits for oil and gas on public land and 5 oil and gas leases on Indian land. Supervised 5 leases, 2 permits, and 3 licenses for coal.

Utah.—Supervised 31 power projects; completed 100 miles of river-utilization surveys on the East and West Forks of the Sevier River and tributaries and in the Bear River Valley. Supervised 11 leases and 688 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land. Supervised 43 leases, 71 permits, and 2 licenses for coal, 11 sodium permits, and 8 potash permits.

Washington.—Supervised 9 power projects; completed 205 miles of river-utilization surveys on the Cowlitz, Green, Sauk, Skagit, and Toutle Rivers and the East and North Forks of the Lewis River and tributaries; surveyed in detail 50 square miles in 9 dams and reservoir sites; and made detailed surveys of 7 dam sites. Supervised 10 prospecting permits for oil and gas on public land, 1 lease and 17 permits for coal, 1 sodium permit, and 3 silver and gold leases (Indian).

Wisconsin.—Supervised one power project.

Wyoming.—Examined land in Blind Bull-Deadman Creek area, Lincoln County, for purposes of mineral classification and one tract in Carbon County for classification as to sodium. Supervised 10 power projects; completed 44 miles of river-utilization surveys on the Laramie and Bear Rivers and tributaries; and surveyed in detail 30 square miles in 2 dam and reservoir sites. Supervised 431 leases, 1 suspended preference right, 1,632 prospecting permits for oil and gas on public land, and 25 oil and gas leases on Indian land; 56 leases, 66 permits, 25 licenses, and 4 awarded coal leases; and 2 prospecting permits for sodium.

WORK ON PUBLICATIONS

Texts.—The book publications of the year numbered 50, covering 8,901 pages. Besides these publications 31 brief papers in mimeographed form were issued as memoranda for the press. During the year 20,777 pages of manuscript were edited and prepared for printing, 1,237 galley proofs were read, and 5,743 page proofs were revised. Indexes were prepared for 29 publications, covering 5,438 pages. Copy and proof or stencils for 971 pages of multigraph or mimeograph matter were read. In addition to the Survey work the proof reading for the report of the Sixteenth International Geological Congress and the volume on copper resources of the world published by that Congress was completed. The fourth edition of "Suggestions to authors", much revised and enlarged, was published during the year.

Illustrations.—The section of illustrations prepared 1,695 drawings and photographs, transmitted 766 illustrations to accompany 47 reports, received and examined 706 proofs, and examined 71 editions.

Geologic editing and drafting.—The geologic map of Colorado, scale 1:500,000, was completed and published. The geologic map of

Texas in four parts, scale 1:500,000, was engraved and transferred to stone, and color sheets were prepared. The geologic map of South Dakota was received for publication. Illustrations for 37 papers were edited, proofs of 15 maps and sections were read and criticized, and 140 drawings, ranging from large maps with structure sections to text figures, were made to illustrate papers by Survey geologists to be published by State surveys or other non-Federal organizations. Editorial and other assistance was rendered to several State surveys in the preparation for publication of geologic maps of the respective States.

Distribution.—A total of 331 publications, comprising 50 new books and pamphlets, 114 new or revised topographic and other maps, and 167 reprinted topographic and other maps, were received during the year. Several special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 107,059 books and pamphlets and 697,995 topographic and other maps, a grand total of 805,054. The division distributed 93,708 books and pamphlets, 2,511 geologic folios, and 730,200 maps, a grand total of 826,419, of which 2,271 folios and 587,697 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were \$36,958.88, including \$36,345.03 for topographic and geologic maps and \$613.85 for geologic folios. In addition to this \$7,709.42 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$44,668.30.

Engraving and printing.—During the year 84 newly engraved topographic maps, including 7 revised maps, and 30 special maps were printed, making a total of 114 new or revised maps printed and delivered. Of the newly engraved maps 37 were completed under the Public Works allotment. Corrections were engraved on the plates of 153 maps. Reprint editions of 150 engraved topographic maps, 5 special maps, and 12 photolithographed State and other maps were printed and delivered. In addition, 56 new topographic maps had been engraved and were in press June 30, including 32 under Public Works allotment, and the engraving of 112 other new topographic maps was nearly completed, including 72 under Public Works allotment. One new geologic map was printed, the edition amounting to 4,625 copies. Of new and reprinted maps, 282 different editions, amounting to 701,549 copies, were delivered.

A large amount of work was done for more than 75 other units of the Government and State governments, and the charges for it amounted to about \$208,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed. Of topographic maps, geologic maps, and contract and miscellaneous

work of all kinds a grand total of 4,849,142 copies were printed and delivered.

The photographic laboratory made 14,179 negatives (including 6,816 wet plates for photolithographs, 685 wet plates for photographic prints, 14 paper negatives, 1,316 dry plates, 471 lantern slides, and 4,877 field negatives developed), 17,355 prints (including 3,025 maps and diagrams, 13,337 photographs for illustrations and records, and 993 bromide enlargements), 6,507 zinc plates, 325 intaglio etchings, and 9 celluloid prints, and mounted 4,006 prints.

LIBRARY

The volume of work performed by the library during the year has again been abnormally heavy. Of the 11,201 readers who used the library, more than half were not members of the Geological Survey. A register of distinguished readers recently begun shows, among foreign visitors, representatives of the Geological Institute of the South Manchurian Railway, the Union of Soviet Socialist Republics, the Amtorg Trading Corporation, and the Bodleian Library, Oxford University. Members of the staff of many colleges and learned institutions in the United States also visited the library in furtherance of their research projects.

The bibliography of North American geology for 1933-34 was issued in February as Bulletin 869. This volume contains 3,836 entries, as compared with 3,454 in the volume for 1931-32. As an overtime project "A list of references since 1928 on National and State planning in the United States", comprising some 280 items, was prepared in cooperation with a representative of the National Resources Committee and issued as United States Geological Survey Library Bibliographical List No. 5. Bibliographical List No. 2, on the Public Works Administration, was also revised and republished.

Perhaps the most satisfactory feature of the library's work for the year was the authorization for the binding of 2,642 volumes, as compared with only 239 for 1935. Last year the library contained some 20,000 volumes badly in need of immediate binding, and the work done this year represents an excellent start on a much-needed binding program.

The accessions during the year were 19,368 books, pamphlets, and serial parts and 1,221 maps and charts. The total circulation during the year amounted to 40,420 copies.

APPROPRIATIONS AND EXPENDITURES

The appropriations made directly for the work of the Geological Survey for the fiscal year 1936 included 10 items, amounting to \$2,285,560, of which \$57,256.60 remained unobligated on June 30, 1936. In

addition, \$6,500 was allotted from appropriations for the Interior Department for miscellaneous supplies.

Classification of obligations incurred by the United States Geological Survey during the fiscal year ended June 30, 1936

	Salaries	Topo- graphic surveys	Geologic surveys	Alaskan mineral resources	Gaging streams
Salaries of permanent employees.....	\$127,952.09	\$579,991.87	\$373,205.09	\$40,293.00	\$870,555.08
Wages of temporary employees.....		646,073.25	25,160.00	11,244.20	24,779.82
Supplies and materials.....		14,698.59	4,574.37	1,186.75	30,979.67
Dead storage of passenger-carrying vehicles.....			9.00		34.32
Other storage and pasturage of animals.....		2,228.39	389.63		680.52
Communication service.....		1,551.66	153.91	19.09	4,876.01
Travel expenses.....		131,035.40	25,590.76	11,071.57	74,667.51
Hire, maintenance, repair, and operation of passenger-carrying vehicles.....		2,021.69	2,785.60		26,541.18
Transportation of things.....		3,993.71	1,544.50	4,525.07	8,103.01
Hire, maintenance, repair, and operation of freight-carrying vehicles.....		77,206.41	7,446.63	64.75	29,519.68
Printing and binding.....		98,659.94	7,978.04	511.41	8,551.73
Furnishing of heat, light, power, water, and electricity.....		13.09	17.65		148.74
Rents.....		168.73	67.69	615.99	3,069.04
Repairs and alterations.....		6,704.29	2,470.56	150.74	20,487.62
Special and miscellaneous current expenses.....		44.00	33.56	65.68	61.15
Purchase of passenger-carrying vehicles.....		429.29	1,519.08		11,892.92
Purchase of freight-carrying vehicles.....		4,056.28	3,872.92		13,497.10
Purchase of scientific instruments and parts.....		25,448.55	2,252.08	59.00	43,567.75
Other equipment.....		18,822.88	3,365.54	1,238.40	13,695.54
Structures and parts.....					25,523.19
Miscellaneous refunds, adjustments, and transfers.....	69.96	105,032.69	2,726.51	609.33	120,616.06
Total.....	128,022.05	1,718,180.71	465,163.12	71,654.98	1,331,847.64

	Classifica- tion of lands	Printing and bind- ing	Prepara- tion of illustra- tions	Geologic and topo- graphic maps	Mineral leasing	Total
Salaries of permanent employees.....	\$131,457.23		\$17,397.99	\$229,845.84	\$253,593.59	\$2,624,291.78
Wages of temporary employees.....					46,291.56	753,548.83
Supplies and materials.....	925.59		21.60	54,700.44	1,786.22	108,873.23
Dead storage of passenger-carry- ing vehicles.....						43.32
Other storage and pasturage of animals.....	4.00				37.72	3,340.26
Communication service.....	211.81			6.38	2,341.62	9,160.48
Travel expenses.....	10,250.72		3.00	364.57	16,382.71	269,366.24
Hire, maintenance, repair, and operation of passenger-carrying vehicles.....	2,875.87				11,402.16	45,626.50
Transportation of things.....	711.45			520.65	1,678.77	21,077.16
Hire, maintenance, repair, and operation of freight-carrying vehicles.....	52.40				675.48	114,965.35
Printing and binding.....	502.16	\$110,000	155.97	137.50	2,208.34	228,705.09
Furnishing of heat, light, power, water, and electricity.....					4,135.32	4,314.80
Rents.....	6.00				643.05	4,570.50
Repairs and alterations.....	79.95			9,438.37	1,305.20	40,636.73
Special and miscellaneous cur- rent expenses.....					103.63	308.02
Purchase of passenger-carrying vehicles.....	750.91				5,121.69	19,713.89
Purchase of freight-carrying ve- hicles.....	834.00					22,260.30
Purchase of scientific instru- ments and parts.....	74.00			215.28	108.83	71,725.49
Other equipment.....	946.92			22,436.00	5,344.16	65,849.44
Structures and parts.....					4,546.92	30,070.11
Miscellaneous refunds, adjust- ments, and transfers.....	290.19		19.34		4,975.43	234,339.51
Total.....	149,973.20	110,000	17,597.90	317,665.03	362,682.40	4,672,787.03

In addition to the amounts indicated above, cooperating agencies expended directly \$39,540.84 for topographic surveys and \$354,655.48 for stream gaging.

Oregon.....	5, 50, 100	§ 48	101	1, 193	101	17	283	1, 241	39, 125	40.5	102	33	22
Pennsylvania.....	20	-----	900	-----	-----	-----	23	620	39, 776	88.1	113	155	3
Rhode Island.....	10	23	-----	-----	-----	-----	-----	-----	1, 248	100.0	-----	-----	-----
South Carolina.....	-----	-----	-----	-----	-----	-----	-----	-----	14, 967	48.3	-----	-----	-----
South Dakota.....	20	-----	75	-----	-----	-----	-----	75	19, 887	25.6	80	-----	-----
Tennessee.....	5, 25, 50	17, 057	135	-----	17, 097	60	121	-----	23, 633	56.2	234	217	-----
Texas.....	20	-----	33	-----	-----	-----	-----	33	89, 923	33.8	-----	-----	-----
Utah.....	100	-----	-----	1, 138	-----	-----	-----	908	20, 780	24.4	103	-----	-----
Vermont.....	20	-----	205	-----	-----	-----	-----	30	8, 739	91.4	3	-----	-----
Virginia.....	10, 20, 50	6 136	676	-----	92	16	774	175	37, 897	88.9	77	205	6
Washington.....	5, 25, 50, 100	§ 32	35	173	-----	-----	6	234	39, 896	57.7	329	47	-----
West Virginia.....	20	-----	75	-----	-----	75	-----	-----	24, 170	100.0	30	-----	-----
Wisconsin.....	20	-----	145	-----	-----	-----	-----	145	19, 754	35.2	47	16	-----
Wyoming.....	50, 100	-----	-----	748	-----	-----	158	748	33, 370	34.1	120	-----	-----
Total continental United States (exclusive of Alaska).....	-----	65	10, 806	5, 637	31, 654	514	7, 554	10, 487	1, 425, 000	47.1	4, 459	3, 569	85
Hawaii.....	-----	-----	-----	-----	-----	-----	-----	-----	6, 435	100.0	-----	-----	-----
Puerto Rico.....	-----	-----	-----	-----	-----	-----	-----	-----	154	-----	-----	-----	-----

¹ Prepared from aerial photographs with field examination and showing culture, drainage, and woodland, but no contours (planimetric mapping). Advance-sheet reproduction by three-color photolithography.

² Revision mostly of culture only.

³ Resurveys in large part cover areas previously surveyed on a smaller scale.

⁴ New surveys cover areas not heretofore mapped.

⁵ Advance-sheet reproduction by one-color photolithography.

⁶ Includes 92 square miles planimetric mapping (see footnote 1) and 44 square miles with contours, advance-sheet reproduction by three-color photolithography.

*Summary of outstanding mineral withdrawals and classifications, June 30, 1936,
in acres*

State	Coal		Oil		Oil shale		Phosphate		Potash
	With- drawn	Classified as coal land	With- drawn	Classi- fied as oil land	With- drawn	Classi- fied as oil-shale land	With- drawn	Classi- fied as phos- phate land	With- drawn
Alaska.....		56, 993							
Arizona.....	139, 415								
Arkansas.....		61, 160							
California.....	17, 603	8, 720	1, 178, 392						90, 324
Colorado.....	4, 142, 233	3, 082, 272	215, 370		1, 172, 778	952, 239			
Florida.....							66, 796	120	
Idaho.....	11, 520	4, 603					276, 239	270, 036	
Louisiana.....			466, 990	4, 233					
Montana.....	6, 259, 193	9, 373, 884	1, 336, 697	67, 651			280, 089	3, 833	
Nevada.....	83, 673								39, 422
New Mexico.....	4, 119, 616	984, 829							9, 282, 160
North Dakota.....	5, 954, 364	11, 178, 286	84, 894						
Oregon.....	4, 361	18, 887							
South Dakota.....		250, 093							
Utah.....	3, 404, 043	1, 267, 697	1, 344, 473		2, 737, 274	2, 703, 755	277, 344	2, 937	
Washington.....	691, 801	141, 444							
Wyoming.....	2, 143, 991	36, 847, 235	541, 777		2, 079, 897	425, 214	989, 133	25, 293	
Total.....	26, 971, 813	33, 276, 103	5, 168, 593	71, 884	5, 989, 949	4, 081, 208	1, 889, 601	302, 219	9, 411, 906

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).

² Includes 13,578 acres withdrawn as helium reserve.

³ Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

General summary of cases involving land classification

Class of cases	Record for fiscal year 1935-36						Record since receipt of first case	
	Pend- ing July 1, 1935	Re- ceived during fiscal year	Total	Acted on during fiscal year	Pend- ing June 30, 1936	Gain or loss during fiscal year	Re- ceived	Acted on
General Land Office requests:								
General.....	81	438	519	500	19	+62		
Time extensions.....							2, 313	2, 313
Oil development.....	14	134	148	143	5	+9	17, 523	17, 518
Concurrence.....	58	1, 139	1, 197	1, 176	21	+37		
Committee cases—Oil and potash.....	1	117	118	105	13	-12	12, 868	12, 855
Applications for classification as to mineral:								
Oil.....	176	1, 121	1, 297	1, 167	130	+46	28, 541	28, 411
Miscellaneous.....	1	2	3	3		+1	935	935
Applications for mineral permits.....	33	724	757	748	9	+24	62, 051	62, 042
Applications for mineral leases.....	20	336	356	147	209	-189	2, 481	2, 272
Applications for patent, potassium.....							124	124
Federal Power Commission cases:								
Preliminary permits.....	12	50	62	57	5	+7	398	393
Licenses.....							28	28
Determinations under sec. 24.....	2	54	56	37	19	-17	592	573
Applications for classification as to power resources.....	1	9	10	9	1		551	550
Applications for rights-of-way.....	9	96	105	90	15	-6	7, 188	7, 173
Irrigation project reports.....	2	3	5	3	2		944	942
Indian Office requests for information.....		1	1	1			9, 549	9, 549
Unit or cooperative agreements:								
Cases involved.....	1, 454	1, 805	1, 3, 259	731	2, 528	-1, 074	3, 259	731
Total.....	1, 864	6, 029	7, 893	4, 917	2, 976	-1, 112		

¹ 792 units involved.

Mineral production from public lands and revenues accrued therefrom, fiscal year 1936

State	Petroleum (barrels)	Natural gas (M cubic feet)	Gasoline (gallons)	Coal (short tons)	Potas- sium (short tons)	Sodium (short tons)	Phos- phate (short tons)	Accrued revenues
Alaska.....								
Alabama.....				49, 156				\$4, 997. 92
Arizona.....				2. 50				. 63
California.....	18, 894, 251	41, 539, 464	66, 839, 619	98		54, 215		2, 901, 746. 27
Colorado.....	1, 141, 737	2, 243, 987	82, 405					
Idaho.....				988. 65			50, 207	5, 016. 72
Louisiana.....								
Montana.....	468, 305	2, 698, 750		427, 546. 81				110, 177. 06
Nevada.....								160. 00
New Mexico.....								
North Dakota.....				453, 600. 38				27, 892. 09
Oklahoma.....								
Oregon.....				166				211. 00
South Dakota.....				2, 028. 52				410. 81
Utah.....	1, 547	27, 314	1, 442	1, 143, 939. 68				134, 144. 10
Washington.....				29, 472. 35				2, 947. 24
Wyoming.....	8, 918, 335	15, 630, 429	27, 425, 803					
Total.....							50, 207	
1935.....	28, 269, 714	73, 033, 325	97, 864, 356	3, 434, 672. 61	334, 367	55, 307	38, 184	4, 388, 203. 93



BUREAU OF MINES

(JOHN W. FINCH, *Director*)

The work of the Bureau of Mines is administered from offices in Washington, but its activities are conducted in mining districts throughout the entire country. Thirteen experiment stations (at Pittsburgh, Pa.; Bartlesville, Okla.; Tuscaloosa, Ala.; New Brunswick, N. J.; Minneapolis, Minn.; Rolla, Mo.; Salt Lake City, Utah; Reno, Nev.; Tucson, Ariz.; Berkeley, Calif.; Seattle, Wash.; Laramie, Wyo.; and Boulder City, Nev.) are equipped to study problems connected with mining, utilization, and conservation of the Nation's mineral resources in their localities, a number of field offices are assigned specialized duties, and the safety instructors move on a flexible schedule, visiting mining establishments on request.

During the fiscal year 1936 the Bureau consisted of the Technologic, Economics and Statistics, Health and Safety, and Administrative Branches.

The Technologic Branch, which conducts research covering all phases of the mining industry at the various field stations, comprised the Mechanical, Mining, Metallurgical, Petroleum and Natural Gas, Experiment Stations, and Explosives Divisions, but on July 1, 1936, was reorganized to include the Coal, Mining, Metallurgical, Petroleum and Natural Gas, Explosives, and Nonmetals Divisions.

The Economics and Statistics Branch prepares special reports on mineral economics and assembles data on the production and consumption of mineral commodities; it is also responsible for the annual publication entitled "Minerals Yearbook." In 1936 it consisted of the Coal Economics, Petroleum Economics, Metals and Nonmetals, Foreign Mineral Service, and Mineral Resources and Economics Divisions. In accordance with reorganization effective July 1, 1936, the Branch in 1937 will comprise the Coal Economics, Petroleum Economics, Mineral Production and Economics, Metal Economics, Nonmetal Economics, and Foreign Minerals Divisions.

With reconstitution of the Health Division, recessed in 1933, the Health and Safety Branch again functioned in two divisions—Health and Safety. This Branch is responsible for safety training, answers emergency calls for aid after disasters at mines or mineral plants, and surveys conditions that may affect the health of workers.

The Office Administration and Information Divisions are the two service groups comprising the Administrative Branch. The first

handles personnel, property records, accounts, and multigraphing, and the second is responsible for the editing and distribution of the Bureau's publications and motion-picture films. The Assistant to the Director of the Bureau acts as chief of the Branch.

SUMMARY

Finances.—The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1936, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were \$2,116,101.51. Of this amount, \$2,097,031.84 was spent, leaving an unexpended balance of \$19,069.67.

On the regular work of the Bureau \$2,039,901.32 was expended. This figure is subject to slight corrections due to unpaid obligations.

In addition, for the helium program, which is purely service work for the Army and Navy and has no part in the regular program of the Bureau, \$18,000 was appropriated directly to the Bureau, and \$20,000 was transferred from the Army and Navy for the purchase at cost of helium produced by the Bureau for the national defense establishment.

Technologic branch.—Eighteen devices for use in mines were approved, and 60 lamps containing a simplified methane indicator developed by the Mechanical Division were used in a number of mines. About 8,000 additional samples of coal and coke were analyzed, and petrographic, carbonization, hydrogenation, and coking tests conducted on special types of coal.

The new metal-mining research section of the Mining Division studied detachable rock-drill bits and drill-steel shop practices. The division also investigated four mine-ventilation problems at the request of mine operators. A survey of the status of mining districts in the Western States was begun and field work was conducted in Arizona, California, and Nevada. Geophysical prospecting to locate underground water supplies was carried on in Nevada.

The Metallurgical Division developed a new method for extracting manganese electrolytically that may make exploitation of this country's low-grade deposits feasible. The division also demonstrated several methods of treating domestic chromite ores and made scientific contributions to the theory of metallic crystals.

During the year the Petroleum and Natural Gas Division was enabled to resume the semiannual surveys of gasoline sold in representative cities, recessed since 1931. A petroleum experiment station was opened at Laramie to replace the field office closed in 1933. A study of back-pressure data on natural-gas wells resulted in the development of a method for gaging delivery capacity that minimizes

waste of gas. Helium supplied by the Amarillo (Tex.) station was used in the National Geographic Society-Army Air Corps stratosphere flight.

Among outstanding accomplishments of the Experiment Stations Division in 1936 were improvements in methods of purifying clay, feldspar, and other low-grade nonmetallics by froth flotation, development of a method for determining minute quantities of benzol in blood and urine, and discovery that silica is an important factor in the caustic embrittlement of steam boilers. The new Tuscaloosa (Ala.) station has put up-to-date testing facilities at the disposal of the South.

The Explosives Division added 25 explosives and 3 new models of a blasting device to the active permissible list, gave advice to a number of Government organizations regarding the use of explosives, and initiated an investigation of the causes and control of mine fires.

Office of Chief Mining Engineer.—This Office has been conducting tests in the experimental mine, Bruceton, Pa., on the bearing strength and plasticity of potash salt from a mine on the Government lease near Carlsbad, N. Mex. In addition, various substances proposed for use in rock-dusting were tested. A study of Diesel locomotives was concluded.

Economics and Statistics Branch.—The Coal Economics Division continued to supply promptly information on anthracite, bituminous coal, coke, fuel briquets, and peat to producers and consumers of these commodities. A special investigation of the packaged-fuel industry was an interesting feature of the year's work. Cooperation with trade organizations promoted economical publication of the Division's reports. Special material was prepared for a number of the emergency administrations.

The Metals and Nonmetals Division inaugurated publication of Mineral Trade Notes, a monthly periodical presenting timely reports on the status of industrial minerals in all countries, many of these being supplied by American consular offices. Flow sheets of world trade in 50 commodities were completed. A study of scrap metals has been made in the light of the effect of the re-use of metals on metal-mine production.

From September on through the balance of the fiscal year, forecast reports of the probable demand for petroleum prepared by the Petroleum Economics Division were established on a monthly basis. A special study of petroleum asphalt was made in cooperation with the Bureau of the Census.

Throughout the year the Foreign Mineral Service Division cooperated with the Metals and Nonmetals Division in making contacts with foreign offices of the Department of State looking toward

establishment of a regular reporting service that would keep the Bureau informed regarding the status of the mineral industry in other countries. In addition, an economic study of the international flow of mineral raw materials was virtually completed.

The Mineral Resources and Economics Division issued prior to June 30, 1936, a series of approximately 50 preliminary reports containing statistical and economic information on virtually all of the important commercial minerals. Special efforts were made to complete the Minerals Yearbook, 1936, at an early date; it was sent to the Government Printing Office on June 17 and issued on August 14, nearly 4 months earlier than the corresponding volume for 1935.

Health and Safety Branch.—The most important work of the reconstituted Health Division was an investigation of dust disease. This included field examination of health conditions at mines in several States and laboratory determinations of particle-size distribution and number concentration of dust.

The Safety Division trained 72,038 members of the mining industry, so that about 963,000 in all have been trained since the Bureau's inception. Moreover, during the year 838 persons earned provisional first-aid instructors' certificates, 188 mineral plants were awarded 100 percent first-aid certificates, 113 men took the advanced rescue course, and 849 officials took the accident-prevention course in bituminous-coal mining. Partly as a result of this work, United States mines have had the lowest accident rates in their history for the past 5 years.

Administrative branch.—The Office Administration Division continued to handle matters of administrative routine. The Bureau personnel comprised 664 permanent and 186 part-time employees. The property of the Bureau, including that at all its field offices, was valued at slightly under \$4,000,000.

The Information Division distributed over 476,000 free copies of Bureau of Mines publications during the year, answered 6,350 letters of inquiry on mineral subjects, edited 450 publications, and prepared several hundred illustrations for reports by the Bureau personnel. Motion-picture films prepared and distributed under the supervision of the Division were shown to a total audience of nearly 6,500,000 persons.

Bureau of Mines Advisory Board.—The annual meeting of the Advisory Board to the Bureau of Mines was held on February 6, 1936. Sixteen of the thirty members, appointed by the Secretary of the Interior and representing management and labor in the principal mineral industries, were present. Approval of accomplishments of the Bureau was generally expressed, with special emphasis on the work in safety and prevention of accidents. The Board also

advocated extension of the study of silicosis and of fundamental research in metallurgy and recommended a survey of coal distribution and of crude oil in storage.

FUTURE NEEDS

The increased appropriations available in 1936, as well as the additional facilities afforded by the opening of several new experiment stations, permitted the resumption of many important Bureau of Mines projects recessed due to lack of funds and the initiation of other studies long planned but hitherto impracticable. As the mining industry recovers from the depression, however, the Bureau feels that it can render worth-while service if funds are provided for conducting the work outlined in the following brief review of principal needs.

In the Technologic Branch the Coal Division, which takes over some of the functions of the former Mechanical Division, should have additional funds for research to develop new uses for coal. Of great advantage in this work would be a laboratory, where tests may be made of the suitability of oil from coal as automotive fuel.

The extensive series of mining and milling papers prepared by the Mining Division, covering several hundred metal and nonmetal mines, mills, and quarries in the United States, Mexico, and Canada, should be kept up to date by resurveys and issuance of supplements to the original reports. Other mineral establishments with efficient practice or with unique problems to solve should also be described in additional circulars. An experimental rock tunnel where mine equipment can be tested under duplicate mine conditions is an outstanding need.

An experiment station large enough to carry tests in nonferrous metallurgy beyond the laboratory stage is urgently needed by the Metallurgical Division. The facilities at Boulder City, Nev., should be increased to permit simultaneous pilot-plant-scale tests of various electrometallurgical processes being developed in the laboratory.

Although adequate chemical laboratories and office space will be afforded by the new building at Bartlesville, Okla., quarters adequate for engineering investigations of the Petroleum and Natural Gas Division are still lacking. The possibility that dirigibles may again be part of the national defense calls attention to the necessity of drilling several additional wells on the helium-bearing gas structure of Texas to assure a supply that will fill the anticipated demand.

The research of the Explosives Division has been largely limited to the field of coal mining in the past. Additional funds should be provided to extend the work to other mineral industries.

The new Nonmetals Division should be enabled to continue its studies on the froth flotation of clays (looking toward the use of domestic materials in ceramics), on the separation of quartz from feldspar, and on the removal of iron from nonmetallic minerals.

In the Office of the Chief Mining Engineer much international scientific good will would be fostered if the exchange of a research fellow with the Safety in Mines Board of Great Britain were resumed; extension of this exchange research system to other foreign countries would help this country to keep abreast of modern mining methods abroad.

The Coal Economics Division of the Economics and Statistics Branch should have funds to conduct annual surveys of the distribution of coal, supply current information on changes in production capacity, study the economics of byproduct recovery, and make statistical analyses of the competitive relations between sources of power.

The industry is asking the Bureau to extend the study of the market demand for petroleum already being conducted by the Petroleum Economics Division to cover gas and fuel oils. It is also asking the Bureau to assemble more detailed information on lubricants. Neither of these requests can be filled unless the personnel of the division is increased by workers capable of assembling and analyzing statistics and gaging market trends.

Both the Metal Economics and Nonmetal Economics Divisions find that the entire time of their personnel is taken up by such routine matters as the preparation of chapters for the Minerals Yearbook and the handling of correspondence. Technical men familiar by field experience with economic problems of the mining industry should be added to both these divisions so that original contributions on subjects of current interest may be part of the annual output of the Branch.

The usefulness of the Foreign Minerals Division depends largely on prompt transmittal of the material it obtains from foreign offices to the American public in such publications as the Minerals Yearbook and Mineral Trade Notes. With this in mind, it becomes obvious that the division staff should be enlarged to the point where it can maintain an even flow of information to the receiving agencies.

In producing useful information on mining under an adequate research program, the overwhelming need of the Mineral Production and Economics Division is a moderate increase in professional personnel. This personnel should hold the dual viewpoint of mining technology and economics and should represent competent judgment in both fields. The present state of mining in the Southeastern United States, in the Pacific Northwest, and in the area between the

middle tier of Rocky Mountain States and the Pacific coast justifies enlargement of the staffs at the Denver, Salt Lake, San Francisco, and Joplin field offices that serve the growing industry in these regions.

The present interest in occupational diseases, especially those associated with the mining industry, calls attention to the facilities possessed by the Bureau's Health and Safety Branch for studying them. Procedure and apparatus already devised by the Health Division could be utilized with a minimum of delay for the investigation of such a live subject as occurrence of dust disease in the entire mining industry if enabling funds were provided.

The personnel of the Safety Division is inadequate to handle the many calls that come for safety training, for conducting safety meetings, for staging and judging first-aid contests, and for rendering emergency assistance after mine accidents. If funds had been available to increase this group of safety men, the Bureau would have trained its millionth miner in first aid during the past fiscal year. Government appropriations could be devoted to few more constructive programs than promotion of safety among the employees of one of our more hazardous industries.

In the fiscal year 1936 Bureau engineers and scientists wrote over 150 papers, many of them representing the results of original research given for the first time, that were printed in technical journals or presented before scientific societies. This wealth of material should have been published and distributed in the form of Bureau of Mines official reports, but lack of funds prevented. In order to disseminate these data promptly it was necessary to adopt the policy stated above. Additional printing funds would make it possible to present to the public a fairer, more complete picture of Bureau of Mines activities in fulfilling the obligations of its enabling act.

TECHNOLOGIC BRANCH

MECHANICAL DIVISION

Electricity in mines.—The Bureau's methane-indicating device for flame safety lamps has been adopted by two manufacturers, and the lamps have been introduced into a number of mines. To visualize the hazards of gas ignition by electric sparks, galleries in which explosions could be produced at will from such ignitions were constructed and demonstrated to more than 1,200 mining men.

Routine inspection and tests in the electrical laboratories led to formal approval of the following mine equipment: 5 coal-cutting machines, 10 coal-loading and conveying machines, 1 storage-battery gathering locomotive, 1 electric flashlight, and 1 gas detector. In addition to the foregoing, about 35 changes in construction of per-

missible equipment were reviewed and extensions of approval granted covering such changes.

Fuel-economy service.—In addition to aiding Federal agencies to purchase and utilize fuel more efficiently by means of power-plant studies, fuel efficiency tests, and advice on the selection of proper fuels and fuel-burning equipment for specific plants, a boiler feed-water conditioning service has been made available to Federal power plants. A survey of water conditions at all high-pressure boiler plants has been made and assistance on treatment given at about 100 plants.

Fuel inspection and coal analysis.—During the year the total number of analyses of coal and coke made and recorded by the Bureau of Mines and available to other Federal and State agencies as an aid in purchasing fuel to the best advantage has been increased by approximately 8,000.

A second coal-sampling truck was purchased and put in commission during the year. Because of these increased facilities and because of the larger appropriation available, 530 samples were collected at 169 mines, compared with 358 samples collected at 90 mines in the fiscal year 1935.

Use of fuels.—An investigation of the possibilities of beneficiating coal by treating it with chemicals has shown that the effects with most coals are very slight unless comparatively large quantities of chemicals are employed.

Based on past studies of action taking place in fuel beds, a report was issued showing the principles that control the rate of combustion under different conditions.

Constitution of coal.—Eight coals were examined microscopically and petrographically in connection with a survey of American coals. In studying the origin and composition of coals stress was laid on the paleobotany of coal-forming plants and the origin of coals from them. The granular opaque matter, one of the characteristic constituents of splint coals, was found to be derived chiefly, though not exclusively, from the wood of conifers.

Coal carbonization.—Carbonization tests at low, medium, and high temperatures were made on six high-volatile coals and one low-volatile coal. Tests on blends of coals showed that the quality of coke from all high-volatile coals tested was improved considerably by blending with 20 percent of low-volatile coal.

From laboratory studies of the fusion of bituminous coal in the process of coking it appears that the quality of the coke obtained from a coal may be predicted approximately from the degree of plasticity and the range of temperature in which the coal is in a plastic or fused condition.

Physical chemistry section.—Equipment for the continuous hydrogenation of coal at the rate of 6 pounds per hour and for the manufacture of the necessary hydrogen was designed and erected in a special building. Methods of analysis of the oils obtained from the hydrogenation of coal for phenols, amines, olefines, aromatics, and other products, were critically reviewed and tested. The limits of error involved were determined, and some improvements were made.

A quantitative critical study of the rate of thermal decomposition of ethane has shown that this is a single monomolecular reaction. This study should form the foundation of a correct theory of the mechanism of the thermal decomposition of hydrocarbons and permit further conversion into valuable motor fuels of refinery gases now wasted.

The calibration laboratory, which calibrates and sometimes repairs instruments used in physical and chemical testing, has been completely renovated and rebuilt.

Miscellaneous analyses.—Small-scale laboratory assay tests to determine the coking qualities of coal and the probable yield of gas, coke, and byproducts were applied to 14 typical coking coals and to different layers of 6 coal beds. A study was made of the agglutinating properties of certain low-volatile coals and low-rank bituminous coals to determine how this property might best be utilized in classifying these coals according to rank.

An investigation of inert materials to be added to coal in determining agglutinating values showed that the tests are so sensitive to slight differences in separate lots of the same material as to require preparation of a standard sample, preferably sand, for distribution to laboratories making this test.

Conclusions.—The increasing encroachment of competing fuels upon coal makes imperative an increased program of research to develop new uses for it and to improve present methods of utilization to overcome the advantages of other fuels. By providing additional funds urgently needed for continuous operation of the new coal-hydrogenation laboratory the Bureau of Mines can make more rapid progress in the study of the extent to which American coals respond to this treatment and obtain data that, as the production of petroleum declines, may form the basis of a new industry utilizing considerable quantities of coal. Sufficient funds should be made available to permit these studies to be made on an adequate scale.

Federal boiler plants may be considered proving grounds where schemes of boiler-water treatment evolved in the laboratory are applied to actual practice and the results under widely varying conditions noted. In addition, direct savings are made possible in the

operation and maintenance of such plants. An increased appropriation to enable this service to be extended to cover all Federal boiler plants should show excellent dividends in reduced operating costs.

MINING DIVISION

Due to increased appropriations for the fiscal year 1936, the Mining Division was able to resume most of its former activities and to revise others to make them more effective. However, because of the difficulty of obtaining personnel of the proper training and experience, the Division was not completely staffed until near the end of the year.

Metal-mining methods.—Two bulletins were published, Concentration of Copper Ores in North America and Stopping Methods and Costs. Each summarized, analyzed, and interpreted data accumulated during the preceding 7 years and made available to the mining industry a concise record of the latest improved practices in the phases of mining covered. Placer Mining in Nevada, a bulletin written by a member of the Mining Division staff, was published by the University of Nevada and the Nevada State Bureau of Mines.

Metal-mining research.—A metal-mining research section was organized, and a comprehensive field survey was made of the use of detachable rock-drill bits in all the important mining centers of the United States; a first progress report was published as an information circular early in 1936 and a second progress report completed in manuscript form. Coordinated with this survey was a study of drill-steel shop practices. When the results of these investigations are finally assembled they will furnish the mining industry with a comprehensive analysis of the data on these subjects that should lead to decided improvements and economies in rock-drilling practice.

In cooperation with the Missouri School of Mines a survey of the use of underground loading with shovel-type mechanical loaders was completed, and manuscript was prepared in part for a bulletin on this subject.

Rock-drilling and steel-shop practice was studied at an Alabama gold mine where the cost of drill steel and sharpening was excessive. As a result of this study the Bureau was able to make recommendations to the operating company that should lower drilling costs appreciably and increase efficiency.

Coal mining.—The coal-mining section, discontinued in 1933 for lack of funds, was reorganized and field work resumed in December 1935. One information circular, Methods of Development and Pillar Extraction in Mining the Pittsburgh Coal Bed in Pennsylvania, West Virginia, and Ohio, was published. Manuscript for a circular on Longwall Mining Methods in Some Mines of the Middle Western States was completed and is ready for publication.

Nonmetal mining.—Parts IV, V, and VI of a treatise on Sand and Gravel Excavation were issued as separate information circulars, and one circular on a clay mine was completed. Six other circulars were written, and several others are nearly ready for publication.

The field staff was reorganized and equipment assembled for seismologic observations of earth and air vibrations caused by quarry blasting.

Mine ventilation.—A bulletin, Engineering Factors in the Ventilation of Metal Mines, and an information circular, Charts for Determining the Performance of Centrifugal Fans, were published. Each fills a long-felt need and is of especial value in view of the increased attention being given mine ventilation as workings go deeper.

Four special investigations were undertaken at the request of mine operators: (1) A study of fires in anthracite mines, their causes, and methods of prevention; (2) ventilation and air-conditioning survey of the Morning mine, Idaho; (3) ventilation requirements for a proposed 6,561-foot vehicular tunnel to divert road traffic around the open pit of the Utah Copper Co. mine at Bingham, Utah; (4) air-conditioning and ventilation of the Magma Copper Co. mine at Superior, Ariz., where rock temperatures of nearly 140° are found in the lowest workings.

Mineral-industry survey.—A mineral-industry survey was begun in response to a widespread demand that the Government undertake a reconnaissance of the status of the various mining districts in the Western States, including their activities, production, and outlook for the future. Field investigations were conducted in the Mojave district of California, one district in Nevada, and two in Arizona.

Geophysical prospecting.—Twelve monthly issues of Geophysical Abstracts were published. Two information circulars were issued—Induction Prospecting for Shallow Ore Deposits and Small Metallic Objects, and Patents on Geophysical Prospecting Issued in the United States, England, Canada, Germany, France, and Russia. Manuscript was completed for a circular, Prospecting for Water in Arid Regions of the Western States.

Resistivity surveys were made on gas and oil geological structures in Ohio, and considerable work was done in locating subterranean water resources in desert regions of Nevada. A number of mineral areas in Nevada were tested by geophysical methods, and a laboratory was established in Reno for the manufacture and repair of needed instruments.

Conclusions.—The study of mining and milling methods and costs in both metal and nonmetal mining should be continued, with special emphasis on resurveying mines and mills covered by earlier circulars. The results of the resurveys should be published as supplements to

the original papers for the purpose of keeping abreast of advances in mining and milling technique. The demand for publications of this type continues unabated.

Research in mining should be undertaken on a larger scale along lines started in the last year, and funds should be provided for an experimental rock tunnel in which fundamental research can be conducted under controlled but accurately simulated mining conditions on such subjects as drill steel, detachable drill bits, and drill rounds, dust prevention by use of various types of apparatus, and wetting agents, noxious gases produced in blasting, ground support, and timber preservation in mine atmospheres.

METALLURGICAL DIVISION

The past year's work of the Metallurgical Division and the results published will be found of scientific and practical value to the Government, industry, and the public. The division's scope has been expanded by addition of the new ore-testing and electrometallurgical sections.

Electrometallurgical section.—A new method for the electrolytic extraction of manganese from its ores has been developed on a laboratory scale. The manganese metal obtained is of 99.85 percent purity.

Studies indicated that ordinary ferrochromium can be made from some of the low-grade ores of this country, and that there is a possibility of producing a higher-grade alloy by means of the electric smelting of chromite in the presence of sulphides of iron and copper.

One development that shows promise for the treatment of alunite is the volatilization of silica in an electric furnace, leaving a high-alumina residue that will be amenable to ordinary aluminum processes. The potash escapes with the silica fume and can be leached therefrom. The preliminary results of these investigations are in the course of publication as a Government report.

Iron and steel section.—The relative desulphurizing power of all blast-furnace slags likely to occur at 1,500° C. has been determined. This information has been published and removes much of the confusion as to the effect of various changes in slag composition.

A definite relation has been found between the porosity and reducibility of iron ores. This permits proper crushing and will result in improved blast-furnace operation and fuel economies.

A comprehensive bulletin on the production of sponge iron by natural gas was completed and forwarded to the printer.

Metallurgical fundamentals section.—The section completed bulletins giving an authoritative digest and thermodynamic correlation of (1) specific heats at low temperatures, including entropy calculations

for 400 metallurgically important materials; and (2) heats of fusion of 280 materials important in smelting. A similar study of the sulphur, sulphurous gases, metallic sulphides, and sulphates so important to nonferrous base-metal metallurgy was virtually completed.

The first technically feasible method for continuous chlorination of chromite ores was also developed.

The results of low-temperature specific-heat investigations of vanadium and its oxides, lead sulphate, and the crystalline modification of silica supplied fundamental contributions to metallurgy and to the use of silica as a metallurgical refractory.

Metallurgy of copper section.—Recovery of sulphur from smelter smoke by direct precipitation of the sulphur dioxide as a dense salt of ammonium derivatives has been shown to be technically feasible.

The use of aqueous solutions of diethylene triamine for absorbing sulphur dioxide from metallurgical waste has been investigated rather intensively on a small scale. The results indicate a metallurgical importance for this method that justifies large-scale tests.

A considerable amount of study has shown the possibility that an organic compound may be developed to overcome the oxidation of certain solutions used for absorbing sulphur dioxide from waste gases.

All phases of this year's work have been described in a progress report to be published as a report of investigations.

Metallurgy of lead and zinc sections.—It has been shown that lead may be metallized from galena directly by blowing air into a fused bath, but the practical application of this reaction will depend upon the development of refractories to withstand the fluxing action of lead compounds, also upon the control of volatilization of lead.

Metallurgy of precious metals section.—Examination of tailings from my plants shows that much gold is lost because it is included in the gangue as small, metallic grains coated with impurities. These impurities, which have been classified, govern the processes best suited to extraction of the gold. Experiments show that surface alterations due to grinding prevent the flotation of minerals.

Other metallurgical problems investigated during the past year are loss of gold in dredging gravel; roasting a manganese-silver ore with salt to render the silver soluble in cyanide; development of emulsions to float refractory oxidized-lead minerals in lead-silver ores when synthetic mixtures are used; and flotation of waste slime carrying scheelite. Two Bureau papers and one journal article on the work of the section were issued.

Ore-dressing section.—The crushing and grinding of ores constituted a major study. A manuscript on ball-mill grinding has been completed and submitted for approval for publication.

The functions and classification of the newly developed wetting or detergent agents as highly selective collectors, frothers, and emulsifiers have been investigated in both sulphide and nonsulphide flotation. A report giving the results of flotation of the potash mineral langbeinite has been prepared as a Bureau publication.

Tests of the flotation of Vermont talc ores were completed; the results obtained await publication.

A 121-page bulletin, *Microscopic Structure and Concentratibility of Iron Ores of the United States*, and a report of investigations, *A Study of the Occurrence and Amenability to Leaching of the Phosphorus Compounds in Some Red Iron Ores of Alabama*, were published during the year.

Ore-testing section.—A rationalized scheme has been set up which has proved to be effective for assisting in the determination of preferred ore-treatment methods for a wide variety of metallic and nonmetallic ores. Thirty types of ore have been investigated in the course of the survey, which is being made to establish the amenability to standard-treatment methods of ores from various districts throughout the United States.

A study of the limitations of the usual analytical methods that have been found unsatisfactory for certain metallurgical products has been followed by an investigation that showed the value of such innovations as spectrographic methods and the use of adsorption indicators. The first annual report covering the work of this section has been prepared for publication.

Special-studies section.—In connection with the new fundamental investigations of the processes of steel making, a preliminary study of the magnetic properties of basic open-hearth furnace slags was made. A report on this work will be published.

The system $\text{SO}_2\text{NH}_4\text{OH}\cdot\text{H}_2\text{O}$ has been studied, and the conditions necessary for dust to settle from a smelter fume have been determined. A paper on this system has been submitted for publication.

The explosive-crushing machine for ores has been developed further, and explosions at steam pressures up to 3,000 pounds per square inch demonstrate that maximum efficiency results from a pressure of about 1,500 pounds.

A paper on nozzle crushing was presented at a technical meeting.

A bulletin on crushing and grinding has been submitted for Bureau publication. It covers the results of many years of research and includes data on milling, steam shattering, and nozzle crushing.

In connection with the study of mineral physics, the coercimeter was developed and is being applied successfully in determining the efficiency of grinding machinery.

Conclusions.—The outstanding accomplishments of the Metallurgical Division during the year were:

(1) The development of a new method for electrolytic extraction of manganese from its ores that promises to make many low-grade domestic deposits economically exploitable.

(2) Demonstration that several methods for treating domestic chromite ores are technically feasible. A chlorination method was developed; pyrometallurgical methods offer other solutions of the problem.

(3) Scientific contributions to the theory of metallic crystals that include evidence of electrical dipoles at metallic surfaces and interfaces.

The new experiment station at Boulder City, Nev., will be barely adequate for pilot-scale testing of electrometallurgical projects contemplated a year ago. The insistent public demand that other problems of this type be investigated requires additional funds for the facilities needed if these requests are to be met.

The lack of a metallurgical experiment station large enough to permit large-scale tests has been deplored for some time. Funds for building, equipping, and maintaining such a station should be provided. A logical location for such a station is Salt Lake City, the center of the nonferrous-metallurgy industry.

PETROLEUM AND NATURAL-GAS DIVISION

Increased facilities for research on petroleum and natural-gas problems pertaining to conservation of these resources have been assured by allotment of Public Works Administration funds, and construction of the long-requested and greatly needed office-laboratory building at the Petroleum Experiment Station, Bartlesville, Okla., is under way. Increased Federal appropriations made possible the opening on July 1, 1936, of a petroleum experiment station on the campus of the University of Wyoming at Laramie to replace the petroleum field office closed in 1933 due to lack of funds. The university erected a building for the use of the Bureau in studying problems relating to petroleum and natural gas.

Production of petroleum and natural gas.—All production-engineering problems within the division have been correlated closely with the intention of presenting a clearer concept of the fluid-energy relations in natural-petroleum reservoirs. To this end, a monograph was published with the assistance of the Natural Gas Department, American Gas Association, giving complete details of a cooperative study of back-pressure data on natural-gas wells. A method for

gaging delivery capacities of gas wells that minimizes waste of gas has been developed, and many other practical applications to production technique have been found. Tests on wells in new high-pressure fields in Kansas, Oklahoma, and Louisiana have increased knowledge regarding pressure and temperature conditions in the reservoir and the control and regulation of combination gas and oil wells with high gas-oil ratios. Bottom-hole samples from these and other fields were tested, and a report on the solubility of natural gas in the reservoir oil from the Crescent (Okla.) pool was published.

Field studies were made of commercial methods of increasing oil recovery through application of data relating to permeability, porosity, saturation, and other characteristics of reservoir rocks and of fluids. An investigation of oil-well cores indicates that appreciable quantities of water occur in oil sands in some areas where the wells do not produce water. This condition is important, not only in estimating reserves but also in applying stimulative methods of oil recovery.

Natural-gas transportation.—A monograph resulting from cooperative work with the natural gas department, American Gas Association, reports the results of several years' study of the flow of natural gas through high-pressure transmission lines. A paper on hydrocarbon hydrates and their relation to pipe-line operation has been presented to the industry.

Engineering field studies.—At the request of the State of Michigan, Bureau engineers augmented their earlier study of the extent and availability of natural-gas reserves of the "stray" sandstone horizon of central Michigan and have completed a report, to be published by the State utilities commission, giving data and estimates as of February 1, 1936.

A report on the performance of wells producing from limestone reservoirs was completed as the result of a detailed study of the Big Spring and other west Texas fields.

Special engineering problems.—The State of Kansas, recognizing that consideration of technical factors giving proper weight to economic and social conditions is the most desirable approach to the problem of disposal of oil-field brines, arranged for an investigation in cooperation with the Bureau. Reports dealing with correct methods of plugging wells, return of brines to subsurface formations, and other aspects of the problem have been published. Not only is the industry being benefited but the detrimental effects of brines upon crops and livestock have been decreased, and potable water sources are being protected against contamination.

The Bureau published a report on the reduction of evaporation losses of gasoline in bulk-storage stations. Increased knowledge on

this subject, which the Bureau has studied for more than 15 years, is important in effecting conservation, reducing fire hazards, and preserving the essential characteristics of gasoline.

Resuming its earlier research on oil-field emulsions, the Bureau has found that by relatively simple rearrangements of well equipment and collecting-system facilities the formation of troublesome emulsions can be reduced markedly.

Chemistry and refining of petroleum.—In order to design automobile engines that will take full advantage of the characteristics of gasoline sold to the public throughout the country, automotive engineers must have reliable information as to these characteristics. To supply the needed data, which have been lacking since the Bureau of Mines semiannual gasoline surveys were discontinued in August 1931, the Cooperative Fuel Research Committee and the Bureau of Mines united in making a survey of gasoline sold during the winter of 1935-36. Another survey is under way.

A report describing the Bureau's method of characterizing crude oils with respect to base was published. Two papers dealing with results of the study of methods for determining "molecular" weights of higher-boiling petroleum fractions were presented, and work on the problem is being continued. A bulletin describing the manufacture of paraffin wax from petroleum, issued during the year, has received favorable comment.

Helium section.—The helium production of the Amarillo plant was reduced to 4,663,000 cubic feet because the demand was limited to the requirements of the several nonrigid ships operated by the Army and Navy and the lease of 1,000,000 cubic feet to a commercial operator of nonrigid airships. Helium produced by the Bureau was used for inflating the balloon in which the second National Geographic Society-Army Air Corps stratosphere flight was made. The Bureau supplied about 16,635 cubic feet of helium to the United States Public Health Service, which is cooperating with certain hospitals in the medical use of helium by mixing it with oxygen in the treatment of asthma and other respiratory diseases.

Conclusions.—The handicap of inadequate office space and chemical laboratories under which the division has labored is being removed by the erection of a new building at the petroleum experiment station, Bartlesville, Okla. An engineering building continues to be a facility greatly needed for proper conduct of research and experiments.

In view of the recommendation by the President's Federal Aviation Commission and the group of technical experts known as the Durand Committee that additional rigid airships be constructed and operated, funds should be provided for drilling two new wells and for repairing

existing gas wells to maintain the supply of helium-bearing natural gas. Funds should also be provided for resumption of research on helium.

EXPERIMENT STATIONS DIVISION

Administrative control and coordination of the work of the Bureau's 13 experiment stations were handled by this division. In addition, the Experiment Stations Division supervised the gas and dust laboratory at the Pittsburgh Experiment Station and the Bureau's research on nonmetallic minerals and coal preparation.

Refractory minerals in the Pacific Northwest.—The Northwest Experiment Station at Seattle, Wash., has found that large deposits of olivine on tidewater in Puget Sound, Wash., are suitable, after preparation, for manufacture into a superior type of refractory brick. A series of useful plastic refractories made with soapstone aggregate has also been developed; one of these, containing chrome cement as a bonding material, gave a concrete that had excellent strength at all temperatures to 2,625° F.

Nonmetallic ores of the Southeastern States.—Considerable progress has been made in development of the froth-flotation process for concentrating low-grade nonmetallic ores which cannot be utilized profitably unless more efficient methods are developed for concentrating them.

Kyanite is a mineral that has come into use in recent years for the manufacture of refractories. Most reserves are extremely low grade. Studies under way at the Southern Experiment Station, Tuscaloosa, Ala., indicate that commercial grades of kyanite and barite may be recovered from low-grade ores by froth flotation.

Seasoning of cement.—The Nonmetallic Minerals Experiment Station, New Brunswick, N. J., has investigated further the effects of steam seasoning of cement on retardation of setting. It now seems possible to grind a clinker to finer size than would have been tolerated in former days without making the cement too quick-setting for control, because steam seasoning is far more powerful in control than is the addition of gypsum.

Boiler-water studies.—The outstanding finding of the year is that the so-called "caustic embrittlement" of boiler steel does not take place unless certain amounts of silica are also dissolved in the caustic boiler water. This discovery explains previously puzzling contradictions in the experimental results of different laboratories investigating this subject.

Properties of western coke.—The first authentic information on the physical and chemical properties of coke produced commercially from various western coals resulted from an investigation made at

the Northwest Experiment Station in cooperation with the College of Mines, University of Washington.

Coal-washing methods.—The Northwest and Southern Experiment Stations are continuing the investigation of coal-preparation methods in order to assist the operators with installations and adjustments of coal-washing plants so as to get a maximum of ash reduction with as little loss of coal as possible.

Analysis of mine gases.—In all, 1,010 samples of gases taken in mines and tunnels and in connection with safety investigations were analyzed.

Analysis of gases and vapors.—The microcolorimetric method for the determination of benzene vapor in air, which was recently developed by the gas section, was adapted to the analysis of blood and urine. A new microcolorimetric method was also developed for the determination of toluene in air and in blood and urine. These methods represent a marked improvement in sensitivity, accuracy, and practical application over those previously available.

Dust investigation.—A microprojector arrangement and procedure were developed for determining particle-size distribution and number concentration of dust in the air of mines and tunnels.

The comparative efficiency of the various available procedures and apparatus for determining dust in the air breathed by workmen has been studied to obtain data that will serve as a basis for correlating the results obtained by the various methods now in use.

Surveys of the exposure of miners to dusts were made in several western metal mines. This work is a service to industry in determining existing conditions that affect the health of miners and affords a basis for recommendations for improvement.

Respiratory protection.—Bureau of Mines approval was granted for three hose masks and four mechanical, filter-type, dust respirators. An approval schedule for supplied-air respirators was prepared and a tentative draft submitted to various interested parties for criticism. A final draft is being prepared.

Stream-pollution investigation.—The stream pollution laboratory has continued to act in an advisory capacity to the various States that are sealing abandoned mines to prevent acid mine drainage. The results show conclusively the value of such procedure, which was developed and recommended by the Bureau.

Inflammability of gases and vapors.—Limits of inflammability, ignition temperature, pressure developed, and explosive violence of many combustible air mixtures were determined, as well as the values below which the oxygen must be maintained to prevent explosions of combustible gases and vapors.

Conclusions.—Results accomplished cover a wide field of activity. Coal, potash, cement, and clay industries have been benefited by investigations made during the past year. Among the most important achievements were: (1) Discovery that silica in boiler water is an important factor, heretofore unrecognized, as a cause of "caustic embrittlement" of steam boilers. (2) Development of a sensitive method for detecting small quantities of benzol in blood and urine. (3) Improvement in methods of purifying clay, feldspar, and other low-grade nonmetallic minerals by use of froth flotation.

Completion of the new laboratory building of the Southern Experiment Station at Tuscaloosa, Ala., provides new facilities and working space for research on the further development of the mineral industries of the South.

Additional funds should be provided for expanding the preliminary work conducted during the past year on the purification of clays by froth flotation, so that these domestic sources of raw material for ceramic products may supplant clays now imported. Similar work should be done on separating quartz from feldspar and the removal of iron from nonmetallic minerals.

The modern equipment for coal-washing and ore-dressing research provided at Tuscaloosa should be utilized in promoting greater efficiency and higher recovery of coal and iron ore from southern deposits.

EXPLOSIVES DIVISION

Testing of explosives.—The chief activity of the sections devoted to the physical and chemical testing of explosives and blasting devices continues to be determination of the permissibility of these explosives and devices for use as prescribed by the Bureau in gassy and dusty mines, particularly coal mines. The work is coupled with control over the quality of explosives on the "permissible" list through field sampling and experimental testing. During the fiscal year just ended 25 explosives were placed upon the active list, which now comprises 175 brand names. In addition, three new models of a blasting device that depends upon the shearing of a frangible disk by conversion of liquid carbon dioxide to the gaseous state were approved.

The effectiveness of the testing and control, coupled with the cooperation of the industries and individuals involved, is shown by contrasting the fatality rate of 1.687 per thousand due to explosives and explosions in coal mining in 1907, before explosives testing was begun by the Government, with a rate of 0.176 in 1935, a reduction of almost 90 percent.

Demonstrations of explosives.—Several educational demonstrations designed to illustrate the dangers of black powder and the

advantages of the proper use of permissibles were staged at the request of mine operators.

Cooperation with Government agencies.—Advice and aid were given to and minor investigations on explosives made for the Tennessee Valley Authority, the Patent Office, the Forest Service, the Federal Emergency Administration of Public Works, the Bureau of Navigation and Steamboat Inspection, and the Industrial Accident Commission of the State of California.

Mine fires.—An extended laboratory investigation of the causes, behavior, and control of mine fires, particularly in the anthracite region, was begun, and data on the atmospheres in burning mines were accumulated by field observation and laboratory analysis.

Conclusions.—The Bureau of Mines, through its Explosives Division, is in a position to render invaluable service to the general public in the protection of life and property; it is also ready to be of particular help to persons in mining and related activities. However, its usefulness has been badly hampered by economy measures. Its research work should be aided and increased and its routine services extended to aid all fields of mining, instead of concentrating upon coal. These objectives can be attained with a relatively small increase in the funds now available to the division.

OFFICE OF THE PRINCIPAL MINERALOGIST

Many people write to the Bureau regarding the identification of minerals or ask for information concerning them. During the last fiscal year about a thousand such letters were answered, almost as many specimens were identified, and more than 500 subjects treated. These letters came from every State in the Union (including 99 from New York, 72 from California, and 53 from North Carolina) as well as from a dozen foreign countries.

Field trips were made to obtain information on the beneficiation of spodumene occurring near Kings Mountain, of anthophyllite and dunitite in Avery County, and of clay, mica, and feldspar near Spruce Pine, all in North Carolina; of kyanite at Henrys Knob, S. C.; and of feldspar at Piney River, Va. Other field trips were also made to the Black Hills of South Dakota to collect samples and study the possible need of advice from the Bureau as to certain tin, lithium, and feldspar deposits.

Under a cooperative agreement between the Tennessee Valley Authority, the Harris Clay Co., and the Bureau of Mines, a large clay deposit at Gusher Knob, 7 miles north of Spruce Pine, N. C., was tested, and various nonmetallic minerals in Alabama, North Carolina, Tennessee, and Virginia were investigated.

OFFICE OF CHIEF MINING ENGINEER

Preventing bumps in coal mines.—Study of the cause of disastrous bumps in eastern Kentucky and southwestern Virginia coal mines was continued. The mining method proposed by the chief mining engineer to avoid occurrence of bumps was tried successfully in one mine.

Behavior of coal roof in highly mechanized mines.—The convergence of roof and floor in mines when coal has been extracted rapidly by machine has been investigated in cooperation with two bituminous coal companies to determine the best arrangement for drawing pillars and to provide a safety warning by automatic convergence recorders.

Bearing strength and plasticity of potash salt.—To obtain information on the mining method that will permit maximum extraction of the potash deposit in a mine on the Government lease near Carlsbad, N. Mex., the Bureau has been determining the bearing strength and plasticity of potash salt. This cooperative study has included convergence tests both in the potash mine and the Bureau's experimental mine, where specimens of potash salt were gaged as to plasticity and bearing strength as a pillar in a apparatus designed by the chief of the experimental mine section.

Inflammability of dusts.—Ninety-four samples of coal and other dusts of a mineral nature, including dusts from coal mines, vehicular tunnels, factories, and mills were tested for relative inflammability.

Large-scale dust-explosion tests.—Inflammable dust collected in the exhaust ducts of the Holland vehicular tunnel was studied to determine the maximum amount that could be allowed to collect without danger of propagating a dust explosion through the ducts. Tests of gypsum for rock dusting in coal mines indicated that it had no superiority over limestone under certain conditions and slight superiority under others. Investigations of a wetting agent for coal dust indicated that it, individually, caused no reduction in the explosibility of coal dust treated with it. It was demonstrated that the amount of rock dust required to prevent propagation of a coal-dust explosion varied considerably with configuration of the mine passageways.

International cooperation in mine safety research.—This cooperative work, involving the exchange of research information, has continued to be of much value. The chief mining engineer, who is liaison officer, attended the International Conference of Station Representatives at Dortmund, Germany, September 1935.

Study of Diesel mine locomotives.—An intensive study of Diesel locomotives, which are extensively used in European mines, was made by the chief mining engineer, who visited mining operations in sev-

eral European countries securing information on the subject. He also inspected the official testing stations in these countries with a view to determining a schedule of tests for Diesel locomotives to guard against hazards to safety and health under American mine conditions.

Mine Safety Board.—The Bureau of Mines Mine Safety Board made one recommendatory decision during the year, which related to mine-shaft linings. The Board was also called upon to make recommendations on an explosion disaster and certain other matters.

ECONOMICS AND STATISTICS BRANCH

COAL ECONOMICS DIVISION

Service to coal industry.—The division conducts statistical and economic investigations relating to the bituminous-coal, anthracite, coke, peat, and fuel-briquetting industries. This involves issuance of a series of current weekly and monthly reports, available to producers, distributors, and consumers, that follow short-time movements of supply and demand, as well as detailed annual reports that provide a background for the current service and trace underlying changes in the industry.

Special investigations.—Special publications released during the year include studies of the mechanical cleaning of bituminous coal and of the mechanized mining of bituminous coal and anthracite. The division made a special study (which was published by the National Resources Board) of the effects upon operating efficiency of the British experiment in production control in the coal industry.

The packaged-fuel industry was studied in 1935 for the first time, and the results are published in the Fuel Briquets chapter of Minerals Yearbook, 1936.

International trade in fuels.—The monthly report on the international coal trade included special data on fuel and power in the Netherlands, Spain, Belgium, Italy, and France.

Economies in publication.—The collection of statistical reports through trade agencies, inaugurated several years ago to reduce costs, was followed in the fiscal year 1936. The cooperative arrangement with the National Association of Purchasing Agents for collecting current reports on coal stocks and consumption continues to be very satisfactory. Publication costs were cut by combining reports and condensing tables to make more efficient use of available space. Editions were reduced, and national coal-trade organizations assisted by reprinting extra copies.

Conclusions.—Agencies established under the National Industrial Recovery Act taxed the facilities of the division to supply data on the coal and coke industries. In addition to supplying information to

the National Recovery Administration, the division has answered many requests for information from the Reconstruction Finance Corporation, the Public Works Administration, the Resettlement Administration, the Works Progress Administration, the Tennessee Valley Authority, the Federal Housing Administration, the Federal Securities and Exchange Commission, the National Bituminous Coal Commission, the Department of Justice, and the Federal Power Commission. In all such work the division's service is limited to finding and certifying the facts that may be established by the statistical record or derived immediately therefrom.

The efficiency of the service the division can render would be increased if funds were provided for printing reports in detail and publishing additional data on the coal industry. Producers and consumers of coal should be supplied with the following basic information of national scope:

(1) Annual detailed surveys of the distribution of coal from each producing region to each consuming market, urgently needed to show changes under altered conditions in the industry.

(2) Annual statistics of the domestic fuel market, involving the equivalent of 160,000,000 tons of coal, which would help the coal industry to hold its proper share of the market.

(3) Current information on changes in production capacity, which would show the industry the probable effect of such changes on the market and might discourage unnecessary or unwise expansion.

(4) Economics of byproduct recovery; studies of supply and present and potential demand for the byproducts of coal processing.

(5) Statistical analyses of the competitive relations between coal, fuel oil, natural gas, and hydroelectric power.

METALS AND NONMETALS DIVISION

On July 1, 1935, the Rare Metals and Nonmetals and Common Metals Divisions were combined to form the Metals and Nonmetals Division. The saving in administrative expense enabled the new division to undertake several additional major activities and notwithstanding an increase of almost 100 percent in routine service work, to maintain the normal output of new publications.

Mineral Trade Notes.—In cooperation with the Foreign Mineral Service Division, a monthly publication, Mineral Trade Notes, was inaugurated; this embodies notes and comments on the various metal and nonmetallic industrial mineral industries and brings to American readers abstracts of American consular reports and additional information that otherwise might not be made available promptly. As much of the material in each issue is reprinted later in other publications throughout the world, this service reaches far beyond

the commercial firms, libraries, teachers, and publishers that comprise an already large mailing list. The Trade Notes are sent free to bona fide readers on special request only, and hundreds of unsolicited letters have commended the service, testifying to the broad scope of its usefulness.

Marketing advice.—The furnishing of marketing advice on rare metals and nonmetals has been progressively improved. During the year, revised lists of buyers of 150 different mineral products were compiled from the returns of a canvass of 1,900 names. Services to consumers of mineral raw materials and to the increased number of Government agencies having dealings with the mineral industries also were expanded.

Strategic minerals.—To show the position of the United States with respect to strategic materials, flow charts depicting world trade in 50 commodities were completed.

Consumption of tin.—Prompted by urgent requests from consumers, the division undertook to account for the consumption of primary and secondary tin by industries. This study, which covers the calendar year 1935, affords the first accurate and complete information as to plant inventories and the flow of tin scrap and drosses.

Reports.—A somewhat larger number of chapters for Minerals Yearbook, 1936, was prepared by commodity specialists of the division. More comprehensive commodity studies were published as information circulars on alum and aluminum sulphate, asbestos, jade, lime, and the rare earths. A horizontal study of consumption trends for the various white pigments was issued as an information circular. Only the shortage of mimeographing funds prevented publication of a manuscript on world movement of chromite. Due chiefly to the lack of adequate printing and duplicating funds, a large number of papers were presented before engineering and trade groups or published outside the Bureau. The usual general reviews on rare metals and nonmetallic industries were prepared for the January issue of Mining and Metallurgy, and a variety of other papers were published by the American Institute of Mining and Metallurgical Engineers. Through this and other channels the building materials section released a series of papers directing attention to the implications of a revival of building construction. The calculated housing shortage affords a cumulative demand for more than \$3,000,000,000 worth of building materials. Losses by fire and obsolescence, growth of population, and general industrial developments were studied carefully, and by using the various barometers of building activity real progress has been made in forecasting the demand for structural materials of mineral origin.

A primary obligation of the division is to disseminate information on mineral raw materials. Largely through extralateral activities of the Bureau of Mines staff, over 40 papers covering economic aspects of rare metals and industrial minerals were prepared by experts in their respective fields and released by the American Institute of Mining and Metallurgical Engineers.

Scrap metals.—Future production from metal mines may be influenced largely by the reuse of metals. Recent studies of the scrap problem have been focused upon the respective effects of new and old scrap and of home and market scrap upon the demand for new metals. The elements of a historical review of the iron and steel scrap situation were assembled, and a paper entitled "The Importance of Secondary Metals", read by a member of the division staff at the Waste Material Dealers' Convention, was reprinted in several trade journals.

Conclusions.—Future accomplishment is predicated to a large extent upon accumulated knowledge. A system that will make automatic the flow of current factual data into the files of the division was greatly improved, and the division's commodity files now constitute a most complete reservoir of accurate information regarding natural resources, technology, trade, and markets.

PETROLEUM ECONOMICS DIVISION

Forecast service.—The most important accomplishment of the Petroleum Economics Division during 1936 was the placing of the forecast reports on an established basis. A report is issued about the fifteenth of the month forecasting the demand for the coming month and including recommendations for changes in stocks of gasoline and crude oil and for the production of required crude by States. This work was undertaken at the request of representatives of the petroleum industry and State regulatory bodies, and serves as an economic guide to prevent waste of resources and to indicate a proper balance between supply and demand. Forecast Reports 1 and 2 were prepared for July and August 1935 but not published. Report 3 for September was published and issues for each succeeding month have followed regularly. Additional appropriations, made available for the next fiscal year, insure continuance and improvement of the forecast service.

Surveys.—Special information relating to the origin and distribution of petroleum asphalt was collected by the Division during the last half of the fiscal year. Under a cooperative arrangement with the Bureau of the Census, the usual petroleum questionnaires were enlarged to include data on expenditures and employment and information on contract drilling.

Routine work.—The Petroleum Economics Division includes an economics section and a statistics section. The former prepares the monthly forecast reports, makes special studies of motor-fuel consumption, conducts a survey of fuel-oil markets, collects information on foreign trade in petroleum products, and prepares annual economic review of the petroleum, natural-gas, natural-gasoline, carbon-black, and asphalt industries for Minerals Yearbook. The statistics section prepares the current monthly and weekly publications dealing with production of crude oil, natural gasoline, refinery products, interstate movements, and stocks.

Conclusions.—The steady expansion in the scope of the Division's work has responded to requests by the industry and various agencies dealing with petroleum problems for more accurate and current information. Such current services are particularly useful with the growth of State conservation and regulatory laws and the formation of the Interstate Oil Compact Commission.

The Division is planning to extend and improve the services relating to market demand. This work includes more detailed studies of motor-fuel consumption and distribution, including interstate movements of refinery and natural gasoline. A survey of crude-oil stocks is being undertaken, in cooperation with the Petroleum and Natural-Gas Division of the Technologic Branch, to determine available gasoline content and the desirable economic levels of both crude-oil and motor-fuel stocks. Continuation and extension of the study of the market demand for gas and fuel oils are desirable, particularly in view of the relation of these products to the competitive fuel situation. At the request of certain members of the petroleum industry, consideration is being given to obtaining more detailed information relating to lubricants.

FOREIGN MINERAL SERVICE DIVISION

Survey of international flow of mineral commodities.—An economic survey of the international flow of mineral raw materials, inaugurated in July 1935, will be ready for publication in September 1936. The detailed statistical tables cover the production of and trade in 34 minerals that represent the most essential mineral raw materials on which industrial progress depends. Data have been tabulated indicating the foreign trade of the 10 principal industrial countries that consume more than 90 percent of the commodities covered by the survey. Descriptive text, summarizing geographic distribution, principal uses, and economic factors that influence production and international trade in the minerals involved, is being prepared. With a library of monthly and annual foreign-trade statistical pub-

lications for about 60 countries available for original research, the Division is now equipped to provide current trade statistics on mineral commodities covering virtually all foreign countries.

Consular reporting service.—As a procurement agency and liaison office between the Bureau of Mines and the Foreign Service of the Department of State, the Division has established a reporting service among American consular offices that forms the basis of one quarterly and three monthly bulletins on international trade in minerals. In July 1935 a specialist on foreign minerals was assigned to serve in an advisory capacity to American consular offices in Europe. During the fiscal year every American consulate in Italy and Germany was visited by this specialist, and systems of reporting have been installed whereby the Bureau now receives at regular intervals trade reports that are promptly published in Mineral Trade Notes and other monthly commodity bulletins.

Conclusions.—To review and prepare for prompt publication the increasing volume of trade information received from abroad and to coordinate properly the Division's activities with the authors responsible for preparing chapters for Minerals Yearbook, the time element is an important factor. To meet schedules established for the delivery by the Division of statistical information required by Bureau specialists, it is essential that the personnel be increased.

MINERAL RESOURCES AND ECONOMICS DIVISION

In order to meet the demand for early release of statistics, the Mineral Resources Division published a series of current reports and mineral market summaries. The first of the preliminary reviews covering metal production in 1935 was released in December, and by the end of January 1936, detailed summaries of metal production were available for all producing areas. The series of reports on metals was supplemented by summaries for other minerals; by June 30, 1936, approximately 50 reports had been released to the public covering the most recent essential statistical and economic information on virtually all important commercial minerals.

Minerals Yearbook.—The Minerals Yearbook, 1935, was issued in December 1935. The volume included 75 mineral commodity chapters and comprised 1,293 pages, including a comprehensive index. The demand for this annual official review of the mining industry has grown rapidly in recent years and the distribution of the 1935 volume amounted to nearly 10,000 copies. From the date of the first volume of this series—the Minerals Yearbook, 1932–33—to the present, advance orders for copies have exhausted every edition of the publication before they could be delivered by the printer.

Realizing that the Minerals Yearbook would be of still greater value to the public by achieving earlier publication, special effort was made to complete the 1936 volume at the earliest possible date. To this end many visits were made to important mining districts in order to enlist the cooperation of mineral producers as well as to obtain accurate pictures of current conditions that could be included in the annual reviews. These efforts were successful and the complete manuscript for the Minerals Yearbook, 1936, was forwarded to the Government Printing Office on June 17.

Joint conduct of the census of mines and quarries.—In order to avoid duplicate statistical inquiries as well as to achieve economy, the canvass of the mining industry for 1935 was conducted on a cooperative basis by the Bureau of Mines and the Bureau of the Census. Acting with the advice of the Central Statistical Board, questionnaires of the Bureau of Mines and the Bureau of the Census were consolidated into a single schedule and the resources of both agencies were concentrated on a single canvass for each branch of the industry. Results of this joint effort were less confusion to mineral producers, larger resources for the collection of really important information, and a lower total expense of conducting the work than would have been necessary had both agencies proceeded independently.

Employment, health, and safety of the mine labor force.—The division continued its regular studies of accident frequency and employment in the mining industry. Reports were completed and submitted for publication covering coal, metal, and nonmetallic mining. Studies of employment based on man-hours of exposure to accidents were conducted in cooperation with other divisions of the Bureau and with other Federal agencies.

Mineral information needs indicated by the National Resources Board.—In a report to the President the National Resources Board indicated the need for more adequate data in certain fields of mining statistics and economics. During the past year the Mineral Resources Division has cooperated with the Central Statistical Board in examining the recommendations of the National Resources Board with a view to outlining a practical research program that would produce the needed information. At the invitation of the Central Statistical Board representatives of industry participated in the study of the problem. The possibilities of a more adequate program for minerals has been actively pressed and reports were completed outlining the principal objectives in a well rounded program of economic and statistical research on the nonferrous metals. Attention will be given later to other branches of mining.

Within the limits of its own resources the division continued to work toward the development of information that would make data

available on minerals in closer accord with that available for agricultural products and manufactures. No large progress can be made in this direction, however, until more adequate financial provision is made for the work.

HEALTH AND SAFETY BRANCH

HEALTH DIVISION

The health work of the Bureau, recessed on July 1, 1933, was reestablished on July 1, 1935, through an appropriation of \$50,000, one-half of the money being allotted to health field work in the Health and Safety Branch and one-half to laboratory investigations in the Technologic Branch. In February 1936 the gas and dust sections of the Technologic Branch were transferred to the Health and Safety Branch and the Health Division was reconstituted. The division has a personnel of 23 and a combined allotment of \$71,829 for the fiscal year 1937.

Dust investigations.—The Congressional appropriation under which health work was resumed was given largely for dust-disease investigations; therefore most of the Health Division program, both in the field and in the laboratory, has been focused upon dust diseases. One engineer spent several months studying health conditions at mines in Ontario and Quebec, as well as in California, Arizona, and other States, and submitted several reports on ventilation, wash houses, dust prevention, sampling, and air analysis.

In the laboratory much investigative work is under way, and considerable progress has been made. A microprojector arrangement and procedure for determining particle-size distribution and number concentration of dust were developed which eliminate much of the eyestrain of former methods and give results with less effort and with a saving of time. Several new types of apparatus and procedures have been designed for the determination of dust, with the object of developing methods that are more suitable than those now available for control of exposure to dust in the mineral industries.

Publications.—Four papers on dust disease or other respiratory affections were published by the Bureau and four others read before technical gatherings. Studies have been made in the design of up-to-date wash and change houses, and the results will be published during the fiscal year 1936-37. The Bureau of Mines First-Aid Manual is being revised, and this very important assignment probably will be completed before July 1, 1937.

Conclusions.—The work of the Health Division, both in the field and in the laboratory, is so much in demand that allotments for it should be doubled; there is at present much hysteria concerning

occupational diseases (especially dust disease) in mining, and the Bureau of Mines is by all odds the best-equipped organization to study this particular problem.

SAFETY DIVISION

During the fiscal year ended June 30, 1936, the Safety Division had on its staff 24 engineers, 25 safety instructors, 15 clerks, and 6 other employees, a total of 70 persons, with an operating budget of \$257,464. Safety Division employees are headquartered at 14 different cities, chiefly mining centers, and with 43 automobiles or automobile trucks and 2 railroad mine-safety cars in operation the work is kept in close contact with the mining industry.

Safety training.—The personnel of the Safety Division gave the Bureau of Mines full course of first aid or mine rescue to 72,038 persons in the mining and allied industries in 489 communities and in 33 States. Since the Bureau was organized in 1910 the full first-aid or mine rescue course has been given to 963,197 persons: In coal mining, 719,153; in metal mining, 101,930; in the petroleum industry, 71,557; at metallurgical plants, 23,645; in nonmetallic mining, 11,479; at cement plants, 10,584; in tunnel work, 4,393; and in miscellaneous mining activities, 20,456. It is now fairly well agreed that as a result of this work 200 or more lives are saved annually.

Approximately 50 persons are engaged in the field work of the Safety Division; they personally impart information on safety assembled by the Bureau to more than 300,000 persons every year. Although only 2 of the 10 all-steel safety cars are in active use, 43 automobiles traveled 562,467 miles in the fiscal year 1936. Besides giving training, members of the division's personnel were thus enabled to be present at 56 first-aid contests in 18 States, to stage 39 exhibits in 11 States, to attend 657 safety meetings in 34 States, and to advance mine safety in various other ways.

Attendance at mine disasters.—During the year 25 mine explosions in 8 States and 23 mine fires in 14 States were investigated, and at 20 of these Bureau personnel aided in rescue or recovery work or both. Fortunately, during the year there were but two major disasters (a major disaster is one in which five or more lives are lost), and in these the loss of life was but 17, a favorable comparison with the average of 17 major disasters and 497 fatalities annually in the 5 years preceding the formation of the Bureau of Mines. Undoubtedly, much of this sharp reduction in disastrous mine fires and explosions is due to the work done by the Bureau, and especially to its advocacy of rock-dusting. It is generally conceded that the latter practice prevents the occurrence of many explosions every year. In addition, 38 miscellaneous mine accidents in 14 States, including

those from roof falls, explosives, and electricity, were investigated and reported.

Safety recommendations.—Safety conditions were studied in 140 mines or plants in 23 States. Constructive criticism of existing conditions and definite recommendations for improvement were made. As a result of the suggestions made by Bureau men during or after these inspections, hundreds of important alterations were made in operating conditions, equipment, methods, and practices, which served to prevent accidents. Many of these changes have been reported by the Bureau's field men and an almost equal number by letters of appreciation from mining executives.

Publications.—Sixty-nine manuscripts were prepared by members of the Safety Division for publication by the Bureau of Mines or by technical journals or in the proceedings of technical and other organizations; 30 such manuscripts were published, 13 are to be published by the Bureau or some outside organization, and 12 speeches, presented before safety bodies, may be published by these groups. The published papers covered a variety of subjects, such as electric cap lamps, first-aid training, metal-mine accidents, coal-mine accidents, electricity, mine gases and their sampling and analysis, cost of accidents, methods of reducing accidents, safety rules for mine workers, explosions of gas or dust in mines, explosions of dust in tipples, safety organization work, dust disease, mine fires, questions for examinations for mine officials, oxygen breathing apparatus, permissible explosives, accident-prevention contests, respiratory protection, safety on man trips, and many other subjects. The demand for some of these reports far exceeded the supply. One of the most worthwhile uses of these publications is to answer the hundreds of letters of inquiry on mine health and safety subjects, not only from members of the mining industry but from others seeking information.

Miscellaneous activities.—Many other achievements in the safety field during the past year can be credited to the Safety Division of the Bureau; 838 persons in 26 States were qualified to teach first-aid training and were given provisional first-aid instructors' certificates, and 736 such certificates were renewed for provisional instructors who qualified by doing the required amount of first-aid training during the year; 188 certificates of 100-percent first-aid training were issued to mines or plants in 25 States, where every person in the organization had taken the Bureau first-aid course; 113 expert mine rescue men took the full Bureau advanced course in mine rescue and recovery operations and received certificates; 848 officials in 5 States took the Bureau's accident-prevention course in bituminous-coal mining for higher officials and students, 409 of these qualifying for certificates by taking the full instruction; 17 new safety clubs (chapters of the

Joseph A. Holmes Safety Association) were organized, raising the total to 450 in 28 States; and numerous special studies were made of such subjects as rock-dusting, ventilation, electricity, haulage, air-conditioning, wetting methods, detecting gages, testing roofs, and reducing dustiness of air.

Conclusions.—The past 5 years have established the lowest accident rates in the history of mining in the United States; undoubtedly some of the credit for this record is due to the safety work of the Bureau of Mines. Notwithstanding the excellent progress made, especially in recent years, mining continues to have the worst accident record of all the major industries of the United States, both in frequency and in severity; on the other hand, hundreds of progressive mines are conducted with relatively few accidents, indicating that with the proper educational work the industry as a whole can be conducted with no more accidents than other major industries. The Bureau of Mines has better facilities than any other agency in the United States to promulgate safety instruction, but its present field force of about 50 engineers and safety teachers is inadequate to carry on a safety campaign among hundreds of thousands of mineral workers. If the force and funds for the work were doubled there is good reason to believe that within the next 5 years accident occurrence in the United States mines would be reduced at least 50 percent from present figures.

ADMINISTRATIVE BRANCH

INFORMATION DIVISION

The Information Division, which is the outlet through which the results of the Bureau's scientific investigations are made available to the mining industry and to the general public, comprises five sections.

Publications.—During the past fiscal year the publications section supervised the distribution of 126,059 copies of the free editions of printed Bureau publications and approximately 350,000 reports of investigations, information circulars, and monographs. These were sent, however, only as the result of a direct request either for a specific publication or for all publications on a particular subject. In addition, the Superintendent of Documents sold about 100,000 copies of the Bureau's printed reports.

Numerous brief statements announcing the issuance of new publications or describing current investigations were supplied to the daily and technical press. These short items were printed widely and effectively acquainted the public with the results of the Bureau's work.

The section handled more than 61,350 letters requesting publications or information regarding the Bureau's activities and general mining subjects.

Editorial.—During the fiscal year 11 bulletins, 8 technical papers, 1 economic paper, 1 handbook, 69 separate chapters comprising Minerals Yearbook, 1936, 15 chapters comprising Minerals Yearbook Statistical Appendix, 1935, and 4 miscellaneous reports were edited and sent to the printer—a total of 107 printed publications. Moreover, during the year 58 chapters from Minerals Yearbook, 1935, were prepared for publication as reprints, and 6 other publications were reprinted. Owing to lack of printing funds, however, only part of the Bureau's output could be printed at Government expense; consequently, 156 papers were submitted for publication in the technical and trade press.

The section also edited 31 reports of investigations and 73 information circulars, papers that supply promptly to the mining industry and general public results of Bureau investigations usually described in detail in later printed reports or that supply salient facts on the mineral industries in concise form suitable for use in reply to queries. In addition, 2 monographs and 17 miscellaneous reports were edited.

Motion-picture production.—As a means of disseminating information regarding safety and efficiency in the mineral industries, the Bureau maintains what is perhaps the largest library of educational motion-picture films in the world. These films are prepared under supervision of the Information Division through the cooperation of industrial concerns that bear the entire cost of production.

During the year 2 new film subjects were added, 5 were revised, and 1,059 additional reels obtained for circulation. Through a cooperative arrangement between the National Park Service and the Bureau of Mines, the Bureau obtained the assistance of three of the country's large industrial organizations in the sponsorship of films depicting the Yellowstone National Park, Glacier National Park, Shenandoah National Park, and Big Bend (Tex.) National Park projects.

Library.—The year's accessions to the library comprised 3,728 books and pamphlets, 275 periodicals were received currently, and 4,863 books were loaned for use outside the library.

Graphic section.—In addition to drafting and photographic service the graphic section circulates the Bureau's films. This work is centralized at the Pittsburgh Experiment Station, but there are 16 subdistributing centers throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but exhibitors are asked to pay transportation charges. On June 30, 1936, the Bureau had 1,777 sets of films, in-

cluding 3,502 reels, aggregating 2,023,000 feet. During the year the films were shown on 76,607 occasions before an estimated audience of 6,489,000. The attendance was 31 percent higher than in the last fiscal year.

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, and general administrative routine.

Personnel.—On June 30, 1936, there were 664 full-time employees on duty in the Bureau, distributed as shown in the following table:

	Classification and number of employees				
	Professional	Subprof- essional ¹	C. A. F.	Custodial ²	Total
Washington.....	3 39	3	145	6	193
Pittsburgh.....	4 94	50	52	52	248
Field.....	4 131	28	43	21	223
Total.....	264	81	240	79	664

¹ Includes instrument makers, safety instructors, laboratory aids, assistants, etc.

² Includes laborers, mechanics, messengers, etc.

³ Engineers, 20; chemists, 3; miscellaneous, 16; total, 39.

⁴ Engineers, 41; chemists, 40; miscellaneous, 13; total, 94.

⁵ Engineers, 66; chemists, 32; miscellaneous, 33; total, 131.

NOTE.—Total: Engineers, 127; chemists, 75; miscellaneous, 62; grand total, 264.

In addition to the foregoing full-time employees, the following employees held appointments on a when-actually-employed basis: 59 consultants, 70 excepted, 7 classified, 19 unclassified; and 28 were employed on field agreements. There were also on the roll 3 persons employed under P. W. A. appointments, making a total of 856 employees.

Property.—The property records of the Bureau, as of June 30, 1936, show accounts as follows:

Automobiles and trucks.....	\$88,560.94
Canvas and leather goods.....	3,835.39
Drafting and engineering instruments.....	10,683.56
Electrical equipment.....	61,688.90
Hardware and tools.....	32,833.36
Laboratory apparatus.....	473,654.99
Household equipment.....	18,998.20
Medical equipment.....	8,180.11
Office furniture and equipment.....	295,471.76
Photographic apparatus.....	29,136.61
Machinery and power-plant equipment.....	1,009,454.05
Land, buildings, and improvements.....	1,523,430.92
Rescue cars and specialized apparatus.....	401,988.93
Total.....	3,957,917.72

This property is located in Washington and at the various experiment stations and field offices of the Bureau.

ACCOUNTS

Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910.

Table 2 gives a statement of the distribution of Congressional appropriations to the branches and divisions and the expenditure of these funds in 1936, by Bureau divisions.

TABLE 1.—*Bureau of Mines appropriations and expenditures, fiscal years ended June 30, 1911–36*

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments ¹	Funds transferred from other departments ²	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items ³
1911-----	\$502,200.00	\$34,200.00	-----	\$536,400.00	\$22,818.27	\$513,581.73	\$513,581.73
1912-----	475,500.00	45,640.00	-----	521,140.00	6,239.77	514,900.23	514,900.23
1913-----	583,100.00	47,850.00	-----	630,950.00	4,087.20	626,862.80	626,862.80
1914-----	664,000.00	57,307.79	-----	721,207.79	4,678.29	716,629.50	716,629.50
1915-----	730,300.00	55,424.60	-----	785,924.60	4,178.11	781,746.49	781,746.49
1916-----	757,300.00	48,710.87	-----	806,010.87	9,058.63	796,952.24	796,952.24
1917-----	981,060.00	52,400.00	-----	1,033,460.00	48,588.10	984,871.90	984,871.90
1918-----	1,467,070.00	51,901.98	\$3,062,000.00	4,580,971.98	395,745.10	4,185,226.88	1,172,939.64
1919-----	³ 3,245,285.00	49,542.86	⁸ 8,600,000.00	11,894,827.86	2,452,236.78	9,442,591.08	1,137,471.37
1920-----	1,216,897.00	52,800.00	-----	1,269,697.00	9,592.18	1,260,104.82	1,245,891.36
1921-----	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922-----	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923-----	1,580,900.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924-----	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925-----	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926-----	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927-----	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928-----	3,025,150.00	113,266.45	328,000.00	3,466,416.45	⁷ 736,235.62	2,730,180.83	1,997,270.66
1929-----	2,725,118.00	103,000.00	205,500.00	⁷ 3,753,094.67	⁸ 152,701.34	3,600,393.33	2,280,960.68
1930-----	2,274,670.00	123,300.00	166,200.00	⁸ 2,664,366.38	⁹ 135,714.93	2,548,671.45	2,216,995.72
1931-----	2,745,060.00	120,680.91	166,500.00	⁹ 3,134,595.10	¹⁰ 195,534.37	2,939,060.73	2,304,121.45
1932-----	2,278,765.00	137,866.48	194,500.00	¹⁰ 2,770,712.18	¹¹ 344,689.43	2,426,022.75	2,186,799.92
1933-----	1,860,325.00	75,100.00	184,000.00	¹¹ 2,398,947.38	¹² 488,335.34	1,910,612.04	1,710,949.42
1934-----	1,574,300.00	50,230.00	17,000.00	¹² 1,890,171.98	¹³ 408,674.26	1,481,497.72	1,254,846.72
1935-----	1,293,959.07	50,000.00	126,513.10	¹³ 1,546,989.94	¹⁴ 32,064.57	1,514,925.37	1,349,686.19
1936-----	1,994,011.00	69,500.00	25,005.00	¹⁴ 2,116,101.51	¹⁵ 19,069.67	2,097,031.84	2,039,901.32
Total-----	42,414,749.07	1,815,528.35	15,441,025.11	61,405,498.11	5,766,899.08	55,638,599.03	37,941,712.06
1937-----	2,093,200.00	69,000.00	60,000.00	15,224,200.00	-----	-----	¹⁶ 2,153,021.00

¹ Includes printing and binding, stationery, and contingent funds.

² Includes proceeds from sales of residue gas.

³ Service items include Government fuel yards, helium, and other investigations and services for other departments.

⁴ Includes gas investigations for War Department.

⁵ Includes \$1,586,388 for Government fuel yards.

⁶ Includes War Minerals Relief Commission, \$8,500,000.

⁷ Includes \$719,476.67 unexpended balance reappropriated.

⁸ Includes \$120,216.38 unexpended balance reappropriated.

⁹ Includes \$102,354.19 unexpended balance reappropriated.

¹⁰ Includes \$153,580.70 unexpended balance reappropriated.

¹¹ Includes \$214,713.96 unexpended balance reappropriated.

¹² Includes \$184,056.04 unexpended balance reappropriated.

¹³ Includes \$50,000 unexpended balance reappropriated.

¹⁴ Includes \$25,576.23 unexpended balance reappropriated.

¹⁵ Includes \$2,000 unexpended balance reappropriated.

¹⁶ Estimated.

TABLE 2.—Bureau of Mines expenditures, fiscal year 1936

Branch or division	General expenses	Operating cars and stations and investigation of accidents	Testing fuel	Mineral mining	Oil and gas investigations	Expenses, mining experiment stations	Economics of mineral industries
Office of the Director.....	\$10,600					\$529	
Office of Assistant to the Director.....	9,080					234	
Administrative Branch:							
Office Administration Division.....	29,583	\$30,080		\$144			\$8,200
Information Division.....	5,875	10,459	\$11,260	14,759	\$13,919	7,493	7,691
Total.....	35,458	40,539	11,260	14,903	13,919	7,493	15,891
Office of Chief Mining Engineer.....		49,628					
Technologic Branch:							
Experiment Stations Division.....		104,814	81,210	4,613		94,993	
Explosives Division.....		44,425					
Mechanical Division.....		40,938	92,829				
Metallurgical Division.....				130,337			
Mining Division.....				130,780		89,832	
Petroleum and Natural-gas Division.....					221,061		
Principal Mineralogist.....				6,374			1,825
Total.....		190,177	174,039	272,104	221,061	184,825	1,825
Economics Branch:							
Coal Division.....							68,594
Mineral Statistics Division.....		21,435					96,800
Petroleum Economics Division.....					2,440		32,247
Rare Metals and Nonmetals Division.....							48,897
Foreign Minerals Division.....						357	22,024
Total.....		21,435			2,440	357	268,562
Health and Safety Branch:							
Safety Division.....		273,496					
Health Division.....		56,560					
Total.....		330,056					
Total appropriations.....	55,390	632,000	185,400	288,860	237,866	195,450	286,555
Total expenditures.....	55,138	631,835	185,299	287,007	237,420	193,438	286,278
Total balances.....	252	165	101	1,853	446	2,012	277

TABLE 2.—Bureau of Mines expenditures, fiscal year 1936—Continued

Branch or division	Helium production	Care, etc., buildings and grounds, Pittsburgh	Gas production	Printing and binding	Contingent expenses	Special funds	Total
Office of the Director							\$11,129
Office of Assistant to the Director							9,314
Administrative Branch:							
Office Administration Division		\$5,344		\$15,845	\$11,300		95,152
Information Division				1,698			78,498
Total		5,344		17,543	11,300		173,650
Office of Chief Mining Engineer		1,490					51,118
Technologic Branch:							
Experiment Station							368,976
Explosives Division		80,353		2,993			44,779
Mechanical Division				354			135,942
Metallurgical Division				2,175			224,425
Mining Division				4,256			134,106
Petroleum and Natural-gas Division			\$10,998	3,326			278,710
Principal Mineralogist	\$45,577			1,074	5		8,204
Total	45,577	80,353	10,998	14,183			1,195,142
Economics Branch:							
Coal Division							68,819
Mineral Statistics Division				225			142,669
Petroleum Economics Division				24,434			34,687
Rare Metals and Nonmetals Division							48,897
Foreign Minerals Division						\$556	22,937
Total				24,659		556	318,009
Health and Safety Branch:							
Safety Division							282,111
Health Division				8,615			56,560
Total				8,615			338,671
Total appropriations	47,586	87,690	18,000	65,000	11,300	5,005	2,116,102
Total expenditures	45,577	87,187	10,998	65,000	11,300	556	2,097,033
Total balances	12,009	503	7,002			14,449	19,069

1 Available for expenditure in 1937.

The following table covers expenditures by the Bureau of Mines to June 30, 1936, from allotments from National Industrial Recovery and Public Works appropriations:

Project no.	Description	Allotment	Balance	Expenditure
1	Repair mine rescue station, McAlester, Okla.-----	\$1,000	-----	\$1,000.00
2	Plans for building for experiment station, College Park, Md.	16,800	-----	16,800.00
3	Buildings and grounds, Pittsburgh and Bruceton, Pa.-----	172,000	\$4.48	171,995.52
4	Roads, Pittsburgh and Bruceton-----	13,000	1.16	12,998.84
5	Repairs to experimental mine-----	15,000	.17	14,999.83
6	Repairs to building and equipment, Bartlesville Experiment Station-----	45,000	.52	44,999.48
7	Paving around Bartlesville Experiment Station-----	10,000	3.75	9,996.25
8	Building and equipment, experiment station, Tuscaloosa-----	200,000	732.14	199,267.86
9	Locating underground water resources in Nevada-----	4,950	40.59	4,909.41
10	Extension of Petroleum Experiment Station, Bartlesville-----	250,000	7,058.76	242,941.24
11	Fence, electric circuits put underground, roads, etc., at experimental mine, Bruceton-----	43,450	5,088.54	38,361.46
12	Building for mining experiment station, College Park, Md.	350,006	-----	(1)
13	5-car garage, Vincennes-----	5,000	-----	(2)
14	Construction of bombproofs, protective partitions, and testing floors, for study of hydrogenation of coal, etc.-----	17,000	567.06	16,432.94
	Total-----	1,143,200	13,497.17	774,702.83

¹ Transferred to Procurement Division, Treasury Department, for supervision of construction.

² Transferred to Post Office Department for construction in connection with new post office building.



ST. ELIZABETHS HOSPITAL

(WILLIAM A. WHITE, M. D., *Superintendent*)

MOVEMENT OF POPULATION

On June 30, 1936, 5,390 patients remained in the hospital as compared with 5,315 on June 30, 1935, an increase of 75.

The total number of patients under treatment during the year was 6,240 as compared with 6,015 for the preceding year, an increase of 225.

The total number of admissions during the year was 925 as compared with 824 the preceding year, an increase of 101.

The total number of discharges for the year was 552 as compared with 396 for the preceding year, an increase of 156.

The total number of deaths for the year was 298 as compared with 304 for the preceding year, a decrease of 6.

The total number of discharges and deaths combined was 850, compared with 700 for the preceding year, an increase of 150, or more than 20 percent.

There were 69 burials in the hospital cemetery as compared with 64 the preceding year, an increase of 5. With the cooperation of the War Department the bodies of 27 service men honorably discharged were buried in the Arlington National Cemetery. The other 202 bodies were buried by private undertakers in cemeteries in Washington and elsewhere throughout the United States.

The daily average patient population was 5,373 as compared with 5,266.5 the preceding year, an increase of 106.5.

Movement of patient population, fiscal year 1936

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1936.....	2,694	785	3,479	1,133	703	1,836	5,315
Admitted during year ended June 30, 1936.....	459	158	617	218	90	308	925
Total number under care and treatment during year ended June 30, 1936.....	3,153	943	4,096	1,351	793	2,144	6,240
Discharged as—							
Not Insane.....	7	1	8	1	0	1	9
Recovered.....	106	14	120	48	29	77	197
Improved.....	90	24	114	62	30	92	206
Unimproved.....	88	9	97	31	12	43	140
Total discharged.....	291	48	339	142	71	213	552

Movement of patient population, fiscal year 1936—Continued

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Died.....	111	57	168	76	54	130	298
Total of patients discharged and died..	402	105	507	218	125	343	850
Number of patients remaining on rolls June 30, 1936.....	2,751	838	3,589	1,133	668	1,801	5,390

ADMINISTRATIVE DEPARTMENT

OFFICE OF THE ASSISTANT TO THE SUPERINTENDENT

Supplies.—The supplies produced on the hospital reservation, including farm and garden products, such as tomatoes, beans, parsley, spinach, squash, corn, turnips, etc., were 283,841 gallons of milk, 125,794 pounds of fresh pork, 13,934 dozen eggs, 3,952 pounds of chicken, 29,021 bunches beets, 31,775 bunches carrots, 12,228 ears of corn, 4,150 bunches endives, 5,375 pounds of grapes, 1,827 bushels kale, 28,679 heads of lettuce, 18,750 bunches of green onions and 74½ bushels of dry onions, 948 bushels mustard, 83 bushels pears, 95 bushels green peas, 302½ bushels green peppers, 19½ bushels polk greens, 716 bushels sweetpotatoes, 812 pumpkins, 18,085 bunches radishes, 1,231 bushels rape, 1,510 bushels spinach, 570 bushels squash, 2,386 bushels Swiss chard, 36 bushels green tomatoes and 941 bushels ripe tomatoes, 2,312 bunches turnips and 411½ bushels turnips, and 343 bushels turnip greens.

In addition to that there were made at the hospital 24,731 gallons of ice cream, 1,217 tons of roughage and silage were produced, as well as 2,500 bushels of ear corn.

In the shops there were produced 13,769 pairs of various kinds of shoes and slippers, and in addition 1,404 pairs of shoes were repaired. There were made 126 dozen men's belts, 283 dozen suspenders, 1,137 brushes, 5,730 brooms, 2,197 mattresses, 2,123 pillows, and 6 chair cushions. In the bakery there were turned out 918,105 loaves of bread, 3,264,084 rolls, and 62,522 pounds of pastry. The laundry washed, dried, mangled, and ironed 12,276,099 articles. The power plant manufactured 568,660,000 pounds of steam; the electrical department generated 2,930,540 kilowatts of electricity; there were pumped 383,039,000 gallons of water; and the refrigeration plant produced 7,455 tons of ice and refrigeration.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops, and articles of clothes,

bed linen, tableware were produced by the occupational therapy department throughout the institution. The patients on the wards, under the direction of the occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, assisted in making stand covers, table covers, tablecloths, towels, wove stand covers, rugs, towels, and similar items, and manufactured many hundreds of small toys and recreation items, including checkerboards, chessboards, and cribbage boards.

All the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

Dairy and cow barn.—The Holstein-Friesian herd was again tested for tuberculosis. Several cows showed somewhat suspicious reactions; two of them were slaughtered under Federal inspection at Baltimore, Md. No tuberculous lesions were found in either cow; therefore we must consider the herd free from this disease. The herd consisted of 335 cows, bulls, and heifers that were tested, in addition to approximately 50 calves, a total of 385 animals. This is the twenty-second year that there were no reactions from tuberculosis. This is one of the largest accredited herds in the country.

During this period Bang abortion disease seems to have been eliminated from the herd. No reaction has been found for over a year. The herd was retested March 23 and 24, 1936, and the entire herd passed a clean test.

The herd produced 283,841 gallons of milk during the past year, about 7 percent increase over the previous year. This was an average production of approximately 12,000 pounds of milk per animal per year.

The quality of the milk, as indicated by the various bacteria counts, has been highly satisfactory, the average, well below 10,000 colonies per cubic centimeter (average about 6,800) being well within the requirements for certified milk.

The hospital continues to cooperate with the United States Department of Agriculture in the use of pure-bred bulls from its Beltsville (Md.) Experimental Station.

Piggery.—The hospital slaughtered 530 hogs during the year, which furnished 125,794 pounds of dressed pork, about 30,000 pounds less than during the previous year.

During the past year or more, especially since the cafeteria system has been in effect in the hospital for feeding patients, the amount of garbage available for the piggery has been hardly sufficient to maintain the regular output of fresh pork. At the same time, the garbage seems to be of a better quality and there are fewer complaints about over-fat pork.

Whether the closer feeding of garbage was responsible or not, the fact is that the pork production during the past year fell below that of the preceding year approximately 20 percent, and something around 3 percent below the general average for the past 11 years. This drop in production at a time when everything else seems to be normal brings up the question as to the advisability of a change in the policy in feeding. Should grain be used, in connection with the garbage feeding, as a substitute or alternative, or should some sort of mixture be used? Proper investigations are being made and analyses taken of the various items entering into the feed, which we hope to report as a future study.

Farm and garden.—A survey of the records show that the production of vegetables generally has changed considerably during the past 10 years, both in the character of the variety grown and in production. The following crops have been introduced and are being grown regularly, in addition to those produced in 1925: Asparagus, Swiss chard, collards, endive, mustard, mustard-spinach, rape, rhubarb, rutabagas, Hubbard squash, and turnip greens. Others, among which are broccoli, brussels sprouts, and cress, are being tried, but so far with rather indifferent success, although each has found ready demand whenever available. The total tonnage of vegetables delivered during the 2 years of 1925-26 and 1935-36 increased from 197 tons to 267 tons, or an increase of over 35 percent; this, in spite of the fact that cucumbers and cymplings were practically destroyed by the cucumber worm, onions were below normal, as was also cabbage, while parsnips, rhubarb, rutabagas, and salsify were almost total failures.

Poultry Plant.—The records show deliveries of eggs during the last fiscal year approximating 13,934 dozen, an increase of about 40 percent over those of 1925. The deliveries of fowl, 3,952 pounds, compared to 3,098 in 1925, or 30 percent increase. Up to 1930 the flock was made up mostly of White Leghorns with a sprinkling of grades of various sorts. In 1930 Plymouth Barred Rocks were introduced to augment the meat supply. In this way the quality of the fowl delivered has been greatly improved, the output last year being as noted.

Diet.—The hospital continues the study of the diet. Not only are continued efforts being made to serve a greater variety of food to the patients and a larger variety of greens continued throughout the year, but greater efforts are being made to see that the food is being served in a more appetizing manner.

The manner of feeding through the cafeteria system has been extended. The new Men's Receiving Building and Women's Receiving Building—one opened at the beginning of the fiscal year and the

other at the end of the fiscal year—both have cafeteria service for the patients. More than 3,500 patients are now fed by the direct cafeteria system, and approximately 1,000 additional by a modified form of cafeteria system which will best suit the needs of the various patients. The hospital's method of furnishing food by cafeteria is to give the patients a choice of food. The result of this change seems to be appreciated by the patients, who do not hesitate to express their approval of the improvement in the manner in which food is being served, and the advantages may easily be evaluated by an extract from report of the chief dietitian:

It was interesting to note that two of the patients transferred from C Building to the Women's Receiving Building, who had been tube fed for several days previous to this transfer, chose their food and ate their first meal of their own election in their new surroundings.

The economic advantages are reflected in the report of the superintendent of farm wherein he notes that:

* * * since the cafeteria system has been in effect, the amount of garbage available for the piggery has hardly been sufficient to maintain the regular output of fresh pork.

This confirms reports of the dietitians from the various kitchens where the cafeteria system of feeding is in effect that the garbage from such kitchens has been reduced approximately 40 percent.

A class in diet and disease was taught the student nurses by one of the dietitians. This consisted of 15 lectures.

From March to June two of the dietitians taught classes in dietetics which consisted of 15 lecture periods and 30 laboratory periods. There were 24 student nurses in these classes.

Electric refrigerators have been installed in the dining rooms of Q-1, Q-2, P-1, P-2, C, B, and M buildings, replacing worn out wood ice boxes.

Dishwashing machines have recently been put in the dining rooms of I, P, and Q buildings, which will add to the sanitary washing of dishes and utensils.

Ice cream and pasteurizing plant.—A total of 283,841 gallons of milk, or a daily average of 777 gallons, was clarified and pasteurized at 148° F., held for 30 minutes, then cooled as rapidly as possible to 46° F., and then bottled and canned. These bottles and cans had been thoroughly washed, steamed, and inspected before being used.

About 25 gallons of buttermilk were made daily and bottled and canned.

In the ice-cream department a total of 24,731 gallons of ice cream was made, or a daily average of 68 gallons.

Bakery.—The output of bread during the year was 918,105 loaves, with 3,264,000 rolls and 62,000 pounds of pastry.

During the year a new wrapping machine was installed, permitting not only the wrapping of bread as formerly, but also the wrapping of rolls, thus insuring sanitary delivery and handling.

Laundry.—The work in the laundry continues to increase. The number of pieces laundered during the past year was 12,276,099, about 1,000,000 increase over the previous year. There has been no increase among the paid employees, notwithstanding the additional number of pieces laundered.

Two new presses and one sleeve form have been installed on the second floor of the laundry building.

The electrical department has installed four large fans in the press-room, which have relieved the humid condition to a great extent.

It seems that we have reached the limit of the capacity of the present laundry. Several of the machines have been in operation for a number of years and should be replaced. More room is needed for the exchange system, additional elevators for handling clothes, and sanitary conditions for the quartering of the employees and patients who work in this building.

Shoeshop.—During the year the shoeshop manufactured 13,769 pairs of shoes and slippers; repaired 1,404 pairs of shoes; manufactured all kinds of brushes, amounting to 1,137; made 3,396 pairs of suspenders and 1,512 belts.

There is one paid employee in charge of this department, all the other help being patients.

There was a material increase in the quantity of shoes made in order to meet the requirements of the hospital.

Lawns and grounds.—The opening of the new men's and women's receiving buildings completed the quadrangle including the medical and surgical building, R building, and I building. The quadrangle was graded and sown with grass seed; also all of the area around the women's receiving building and the terrace on the north side of the men's receiving building were similarly graded and sodded. Thirty-six evergreen trees, mostly of dwarf habit, were planted in front of the women's receiving building. In front of the passageways leading from the women's receiving building 45 flowering shrubs, 10 Lombardy poplars, and 5 sugar maples were planted; also 5 sugar maples were planted on the opposite side of the quadrangle on the strip of lawn east of I and N buildings.

Fires.—There were 30 fires during the past year, the total property damage amounting to \$278.40. Fire inspections and fire drills were regularly made. During the year inspections were made weekly with officers and privates of the District of Columbia Fire Department, and occasionally with inspectors from the fire marshal's office. On some occasions there were verbal recommendations made which

were adopted as soon afterward as possible. Inspections are made of all fire hydrants, stairways, fire escapes, basements, hose closets, attics, and grounds in general. The fire extinguishers are regularly inspected and repaired when needed. The fire siren is tested monthly, also the fire-alarm system. The fire pumps at the power-house are tested weekly, and the triple combination pumper is tested daily and put in service once a week. Tests are made of all fire hose, and fire drills are held monthly. Fire drills are held on the wards and note is made of the time required to get the patients off of the wards.

At the present time the hospital has before it a request from the Federal Fire Council for a statement showing the number of buildings on the reservation, number of patients or employees in each building, preparations that have been made for fire fighting, and other information incident thereto.

Disbursements.—During the year Mr. Homer Smith, who was at the hospital for many years, retired as chief of finance and accounts division of the hospital. After he left the service the finance and accounts division was combined with that of the chief accountant's division. Mr. Struttmann, who is the chief accountant at the hospital, was put in charge of the combined work.

The total disbursements of all sorts, which were passed through this office and transmitted to the General Disbursing Office of the Treasury for settlement, amounted to \$3,457,560.

Supplies.—Orders were placed for supplies during the year amounting to \$1,314,224. Of this amount, \$324,000 was covered by formal contracts entered into by the hospital directly with the contracting parties. There were several special contracts under the Emergency Relief and Public Works appropriations, one for installing and testing gravel well, one for elevated steel tank and tower, and others for furniture for new buildings.

Personnel.—The total number of employees on the hospital rolls June 30, 1936, was: Regular, 1,647; P. W. A., 123—a total of 1,770, an increase of 214. The appointments during the year were: Regular, 444; emergency, 228; total, 672. Separations were: Regular, 353; emergency, 105; total, 458, a net increase of 214.

During the year several of the old employees were retired from the service on account of age, including:

E. H. Weisbrod	Chief engineer.
Mary O'Malley	Clinical director.
Amelia Clyburn	Waitress.
Homer Smith	Agent-cashier.
Franklin T. Eno	Bricklayer.
Richard Moore	Chauffeur.
Frank Blinn	Charge, psychiatric nurse.

The following were retired on account of disability:

Emory B. Carter.....	Machinist.
Arthur C. Dorsey.....	Stoker-operator.
Robert A. Jenkins.....	Assistant supervisor.
James D. Poe.....	Attendant.
Tillie M. Skinner.....	Do.
Annie McPherson.....	Assistant cook.
Emma J. Thornton.....	Kitchen helper.
Margaret A. Robey.....	Laundress.
Sadie Pilkerton.....	Charge, psychiatric nurse.
Joseph P. Corrigan.....	Attendant.

Administrative promotions (salary rate increases) were granted to 586 employees, effective February 1, 1936. This was the first general salary increase authorized since January 1, 1931. In addition there were 67 promotions and 5 demotions in grade.

Construction.—The women's receiving building, on which progress was noted in a previous report, was practically completed and furnished ready for occupancy the last part of June 1936. This building affords no novelties nor innovations in methods or standards of treatment not available in other buildings on the hospital reservation. It will, it is believed, make possible the accomplishment of a more economical use of physical comforts and mental treatment methods as a result of the increased efficiency in ward service. Included in this building are such special provisions as beauty parlor, laundry, hydrotherapeutic department, occupational, and recreational rooms.

Congress has made an appropriation for one new building to be known as Continuous Treatment Building No. 3. Preliminary plans and specifications for this building are now under way.

The hydrotherapy department, in connection with the sun parlor for Q building, the colored women's receiving service, was put in operation during the year.

Allocations having been made by the Public Works Administration of funds for reconditioning certain buildings, the following work was completed:

Replacement of wooden porches in Allison-C and Allison-D buildings by concrete and brick porches, enclosed, fitted with iron window sashes of a swinging type, permitting proper ventilation. These porches are heated, permitting them to be used as wards, increasing the number of beds, and in some cases to be used for day rooms; and the Allison-D porch to be used as a barber shop.

Several of the porches connected with Oaks-B, D, and E buildings, constructed many years ago of wood and which were more or less of a fire risk, have been replaced by new porches of brick and concrete enclosed in the same manner as noted in the Allison porches, to be used in some cases as wards, day rooms, or dining rooms.

Two new brick porches have been erected for Garfield and Dawes buildings. These buildings were dark and without adequate day-room facilities. The porches increased the day-room advantages and permit a class of patients who had little outdoor exercise opportunities for enjoying fresh air under sanitary conditions.

The porches of the several buildings to which they are attached have added a total of 27,124 square feet of floor area.

Funds allocated by the Emergency Relief Administration permitted the laying of 1,500 feet of 24-inch terra-cotta pipe surrounded by concrete, to be used as a storm-sewer drain from the head of the ravine at the powerhouse to a point below the incinerator, and to be connected with a 24-inch line at that point.

From funds allocated by the Public Works Administration a contract was made to dig a well. It is what is known as a 30-inch gravel well, being 30 inches at the base and 10 inches at the top. The contract called for a flow of 1,250,000 gallons of water per day. The bond for this contract covers this flow for a period of at least 1 year. This well has been completed, and the official test showed a capacity of 1,899,000 gallons of water per day. The water has been tested by the Geological Survey and test showed it to be of an exceptionally good quality. The temperature test of the water on a warm day showed that it registered 56° at the surface.

A new tank is being erected at such a height and capacity that will give sufficient pressure to furnish water to the upper stories of the new buildings just completed. From the old tank water could only be secured by the use of pumps located in each building.

New fire pumps have been constructed and will be installed within a short period.

The woodwork on the porches of the 13 buildings completed about 1903 have been overhauled and the woodwork replaced by brick and concrete, thus making them less susceptible to fire and more permanent in nature.

A concrete road has been built from general kitchen to Howard Hall. On a recent inspection of the hospital by the Federal Fire Council attention was called to the necessity of such a road, so that fire equipment could enter the grounds of the hall should fire break out. Similar criticism was made by a representative of the District Fire Department. This new road will relieve further criticism of this sort and furnish adequate means for not only the hospital but for District fire apparatus to get inside the wall of the Howard Hall service in case of fire.

The concrete road between R and I buildings has been widened and replaced.

Several thousand feet of the old roads have been repaired.

Concrete walks were laid between C and M buildings and between I and N buildings.

New water mains have been installed from R building to the site of the new water tank, from the men's receiving building to the women's receiving building.

Pedestal drinking fountains, with cooler tank, were installed in the basement of Q building, on the lawn between C and M buildings, and the courtyard of the continuous treatment buildings.

All steam fitting and plumbing have been overhauled and many repairs made.

New floors have been laid in the laundry, in several of the wards of the west side service and in other sections of the hospital.

RECREATIONAL, VOCATIONAL, AND OCCUPATIONAL WORK

Occupational therapy.—During the year the occupational therapy department furnished work for 1,005 patients. This work included weaving, sewing, toy making, woodwork, basketry, and general industrial work. In the industrial department there were made 22,500 sheets, 11,100 pillow cases, 24,300 towels, and 12,275 dresses. It has been the practice as far as possible to permit the patients to make their own dresses.

Red Cross.—The American Red Cross continued to maintain a hospital unit during the past fiscal year.

The psychiatric social workers attached to this unit are primarily concerned in case correspondence and contact work. During the year there have been received 4,296 letters and there have been sent out 4,411 communications. Five hundred and six claims of one kind or another have been filed for the patients, and the patients have been helped in presenting their claims in an equal number of cases.

Three thousand seven hundred and ten tickets of all classes were donated to the Red Cross for the use of St. Elizabeths' patients for football, baseball, and theater parties. There have been two boat trips down the river, one chaperoned by the Spanish-American War Veterans and the American Legion and the other by the Motor Corps of the District Chapter of the Red Cross, the American Legion, and the hospital helping with the transportation. The boats were secured through the sources named.

There have been 10 band concerts on the green during the past year. There have been 167 parties and entertainments and 92 athletic events.

The superintendent of the hospital having instituted a practice of delivering letters of welcome to each patient as admitted to the institution, said letters explaining the nature of the institution and in what way the hospital can cooperate with the patient in helping to

restore his health, the field director of the Red Cross acted as a representative of the superintendent in helping to put such communications in the hands of the patients shortly after they were received in the hospital.

It is recommended by the field director of the Red Cross that the building at present used for that purpose be either made over and enlarged or, as an alternative plan, to add wings to the Hitchcock Hall for the use of Red Cross work, or that funds be furnished for the erection of a new building, including a recreational center for both men and women. Whether this is to be done by the Red Cross or congressional appropriation would have to be determined.

MEDICAL DEPARTMENT

Library.—The library at St. Elizabeths Hospital is divided into two parts, primarily that noted as the medical library and that noted as the patients' library. The total number of volumes in the combined library is about 32,000. About 125 books have been added to the medical library during the year. There were 1,200 books added to the patients' library. Through the kindness of Mr. Alvah Godding, a very valuable addition was made to this library—approximately 1,000 books, including standard fiction, poetry, and drama. There are about 3,500 books in constant circulation, approximately 200 books being drawn daily.

Social service department.—The work of this department included training of students from the hospital training school and from the social-service school. There were four students from the National Catholic School of Social Service and one, a priest, Father Humensky, from the school of social work, Catholic University of America. He was here the full 2 months of September and October, and then, as he and the director of the school were interested in learning what a priest could do for the patients, he continued coming to the hospital several days a week until the end of the school year.

The letter the superintendent sent to each patient, as discussed under the Red Cross, which the field director of that organization delivered to a certain class of patients, was delivered to District patients by the chief of the social service department.

The social service report from July 1, 1935, to June 30, 1936, showed the following:

Number of out-patients on rolls July 1, 1935-----	149
Number of out-patients on rolls June 30, 1936-----	85
Average number on rolls per month-----	130
Number of patients discharged from the rolls-----	152
Number of out-patients under care during the year-----	284
Average carried during 1 month (in and out patients)-----	193
New patients (out on visit)-----	116

Training school.—There were 18 students in the graduating class of the 3-year course of the training school. Sixteen took the District of Columbia Board in October; 14 passed, 1 student failing in two subjects and 1 failing in one subject. The hospital received honors for having the highest school average. Of the 14 nurses who passed the Board, 10 are on duty in the hospital, 2 are in the Veterans' Administration, 1 is married, and 1 is doing private duty.

From July 1, 1935, to June 30, 1936, 107 affiliating students have finished their course and an additional 38 were admitted June 1, 1936, making 145 enrolled during the year. Approximately 60 postgraduate students have completed a course during this period, and there are 32 post-graduate students now in the hospital, making 92 enrolled during the year.

The hospital now receives affiliate students from four local hospitals, from the Parrish Memorial Hospital, Portsmouth, Va.; Riverside Hospital, Newport News, Va.; and the Munroe Hospital, Ocala, Fla. The St. Elizabeths students affiliate at Emergency Hospital for surgery, at Sibley Hospital for surgery and obstetrics, at Children's Hospital, Washington, D. C., and Bellevue Hospital, New York City, for pediatrics, and with the Instructive Visiting Nurse Society.

Forty-nine attendants have completed the course during the year. There are at present 98 attendants in the class.

Medical and surgical wards.—The activities of this service have increased over the previous year.

There were admitted to the wards 1,500 patients and to the clinics 17,001 patients. The clinic patients made 40,056 visits. There were 216 surgical operations.

The physiotherapy department has been more and more utilized, with benefit to the patients.

During the year past an attending otolaryngologist was appointed to fill the vacancy created in that department by the resignation of Dr. Billard. There has been a considerable amount of indicated surgery, such as cases of chronic mastoiditis, as well as a few cases of acute mastoiditis, and conditions relating to the nose and pharynx.

The attending ophthalmologist resigned because of change of residence to another city. His vacancy was filled by the appointment of a local ophthalmologist which did not turn out as successfully as desired and was, therefore, terminated. At the present time there is a vacancy.

The radiographic and radiotherapeutic clinics have been functioning satisfactorily during the year. The radiotherapeutic apparatus, which gave so much trouble for a time, was finally properly repaired and has functioned steadily throughout the year without the slightest

difficulty. One hundred and seventy-eight patients have received X-ray therapy during the year, about 25 percent of these being cases of malignancy in some form.

The antiluetic clinic has treated a considerably increased number of patients during the past year. This is partly due to the actual number of such patients to be treated and partly to some new departures in the method of treatment.

The urological clinic has been attended regularly by the visiting urologist during the year and some of his work has proven quite interesting, although just as interesting is the fact that very few active cases of venereal disease are seen.

The gynecological clinic has continued weekly, although the day of the clinic was changed to accommodate other activities in the institution.

Men's services.—The last three remaining wards in the men's receiving building were opened. The number of patients on the men's receiving service has materially increased. Admissions during the year were 447. Treatments in the hydro room were 68,823.

Due to the fact that the men's receiving building is caring for more acute cases than formerly, the various other services, such as Richardson Group, do not have as many acute cases on the wards, but they continue to have many serious behavior problems and many acutely disturbed patients. A great deal of personal attention has been devoted to the caring for the acutely disturbed patients and endeavoring to assist them in improvement and, it is believed, that a considerable degree of success has been attained.

It is still necessary to devote a considerable amount of attention to inducing patients to write to their relatives, and it is often necessary to write special memoranda to the supervisors of the service requesting that the individual patients write to their relatives. This practice is followed in every case where a relative makes a specific request in a letter to the hospital that a reply be sent by the patient, and almost 100 percent success is obtained in following this system.

In the Richardson Group the hydrotherapy room showed 23,733 treatments.

During the year the chief and radical change in administration of the Howard Hall service was the removal of the supervisor's office from the Howard Hall building to the West Lodge building. The supervisor now uses the office which for a long time was used as a physician's office and later as a visitors' room. The former nurses' office was connected with the small hall in the front of the building by cutting out a large archway and this whole space is now being used as a visitors' room. The nurses' office was moved back to the

room formerly used as the dining room and a 3-bed dormitory was converted into a doctor's office.

Nearly all of the patients in West Lodge 1 now eat in the West Lodge basement cafeteria, a few trays being served on the wards. The patients in the whole of the West Lodge building are under the general supervision of the charge nurse located on ward West Lodge 1.

The moving of the supervisor's office from the Howard Hall building to the West Lodge building has solved a problem which for several years seemed to defy solution—a reception or visitors' room for the Howard Hall proper. At the present time relatives of the patients are received in a nice visiting room adjoining the supervisor's office, and the proximity of the supervisor's office to the admission ward, West Lodge 1, is an added convenience.

The occupational index which was introduced on the various services of clinical division number 1 during the previous year has continued to be very useful and has enabled this division to supply the various industrial departments, such as the laundry, shoe shop, sewing room, and power-house, with the necessary number of patients. As during the past year, the charge of each ward was requested to furnish a list of patients, giving name and case number, whether employed or idle, if employed the type of work done, and some general remarks concerning the patient's behavior and habits. Such lists were gone over with the various physicians in charge and thus there were assigned a number of idle patients to various occupations.

The completion of the porches connecting the Garfield wards, white ash and gray ash, will provide spacious sitting rooms for patients who formerly congregated in the hallways and will release extra beds in these wards.

The cafeteria service in West Lodge is satisfactorily functioning. Generally speaking, marked improvement has been accomplished in the care of the colored male patients, both from the standpoint of the patients' physical comfort and the medical attention given to them.

Women's services.—During the year the retirement of Dr. Mary O'Malley, who was clinical director in charge of the women's services, left a vacancy which has been temporarily filled by having Dr. S. A. Silk supervise professional and administrative work of the Women's division in addition to division number 1. His work in the women's division has been mainly directed toward the improvement in classification and distribution of patients, and the opening of the new women's receiving building.

Preliminary to opening the new women's receiving building the admission service was divided into two services—C-service and P-

service. With the opening of the women's receiving building the women's department will have four services, namely, the women's receiving service, C-service, P-service, and Q-service, the Q-service consisting altogether of colored patients. The new women's receiving building, or new admission building, was opened on June 22, 1936. It has many improvements over any of the other buildings opened. It is not only provided with an admission suite, large and small dormitories, single rooms, special-treatment rooms, cafeteria service for all patients, occupational therapy room, hydrotherapy department, continuous flow tubs, recreational room, but in addition, beauty parlor, and rooms especially set aside for individual laundry work by the patients.

Laboratory.—The work of the laboratory continued along the same lines.

During the past year a considerable amount of effort has been expended in looking up the literature of the physiology of the brain and in reading up on the chemical and physiological ramifications involved.

Over 100 patients with neurologic conditions of unusual or difficult type have been thoroughly studied during the past year.

Electro-encephalographic technique has been introduced and gradually improved.

Psychological office.—During the year admission examinations and notes on the white and Indian women's service were made on 181 cases. Psychological examinations, 211 cases. Special examinations and conferences, 76. Psychotherapeutic interviews, 28. Lectures, 104.

Dr. Kendig is engaged in a study of the psychological material which has accumulated over a period of 15 years in the hospital, in the hope of learning something of the mental functions in dementia precox. It will be recalled that Binet believed that each type of mental illness was marked by a certain type of mental function, and that psychology could identify these types as an aid in early diagnosis. There have been a few sporadic attempts at research along these lines, and it is hoped to do a better job than has so far been done.

Dr. Hunt, a research fellow in psychology from Cornell, has been at the hospital since February engaged on a problem in mental functioning in depressed patients. He left on June 13.

Educational.—The hospital continues to cooperate with the various educational institutions around Washington.

The teaching work with the George Washington medical students was continued through the year as during the preceding year, with

Dr. Lind acceptably substituting for Dr. Lewis in giving a course of lectures to the first year medical students on medical psychology. The arrangement for the second, third, and fourth year medical students was unchanged with the exception that last fall Dr. Lind gave the fourth-year students a course of lectures on the psychoneuroses that had previously been given by Dr. Lewis. In addition, Dr. Lind has continued to have a group of fourth-year students during the year. Dr. Silk, Dr. Duval, and Dr. Twombly also assisted with these students.

Dr. Hall has given two courses of clinical lectures and demonstrations to the University of Maryland students in abnormal psychology. The spring course was composed of 9 lectures and was attended by some 30 students, and the summer course composed of five sessions has about 75 students, most of them school teachers.

Dr. Karpman gave a course of lectures to the students of the Howard University medical school.

The superintendent continues his lectures to the George Washington medical students.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS TO SAINT ELIZABETHS HOSPITAL

A bill has been introduced in Congress, upon the recommendation of the District Commissioners, to change the method of admissions to St. Elizabeths Hospital. The hospital cooperated with representatives of the District upon the form of the proposed bill.

STAFF CHANGES JULY 1, 1935, TO JUNE 30, 1936

The following appointments were made during the year:

Internes: Clara L. Hoyer, William F. Murphy, Arnold H. Ungerman, Daniel J. Sullivan, William Y. Baker, Moorman P. Prosser, William H. Vicary, Zigmond M. Lebensohn, Samuel R. Berenberg, Herbert A. Wiggers, Genevieve M. Stewart.

Visiting oto-laryngologist: David Davis.

Visiting urologist: Alan J. Chenery.

Visiting ophthalmologist: Ronald A. Cox.

The following resignations took effect during the year:

Internes: Sidney Berman, Walther H. Thiele, Eugene J. Alexander, Stephen E. Kramer, Jr., Samuel R. Berenberg, Alfred R. Abrams, and Durward G. Hall.

Clinical director: Mary O'Malley.

Director of laboratories: Nolan D. C. Lewis.

Visiting ophthalmologists: Francis C. Skilling and Ronald A. Cox.

Dr. William M. Kenna, senior medical officer, died during the year.

PUBLICATIONS

White, William A., superintendent:

Outlines of Psychiatry. (14th Ed.) Dec. 1935. Nervous and Mental Disease Publishing Co. Pp. 494.

Paranoia. From The Cyclopedia of Medicine. (Piersol.) Published by F. A. Davis Co., Philadelphia, Pa. Pp. 601-606. 1935.

Emotions and Bodily Changes. (Special Review.) The Psychoanalytic Review. Vol. XXII, No. 4, October 1935. Pp. 439-447.

20th Century Psychiatry. (Its Contribution to Man's Knowledge of Himself.) (Book.) W. W. Norton & Co., Inc., New York, 1936. Pp. 198.

The Influence of Psychiatric Thinking on General Medicine. Mental Hygiene, Vol. XX, No. 2, April 1936. Pp. 189-204.

Cultural Lag and the "Insane." Mental Hygiene, Vol. XX, No. 2, April 1936. Pp. 334-338.

Personality, Psychogenesis, and Psychoses. (Lecture before Pennsylvania School of Social Work, Philadelphia, Pa., April 29, 1935.) Journal of Nervous and Mental Disease, Vol. 83, No. 6, June 1936.

Paranoia and Paranoid Conditions. Oxford Loose-Leaf Medicine, Vol. VII, Chap. VII, Pp. 335-355. 1936.

Modern Housing of Mental Patients. (With Monie Sanger.) Published in The Modern Hospital, Vol. 45, No. 1, July 1935. Pp. 42-47.

Karpman, Benjamin, senior medical officer:

Imitation of Life. Psychoanalytic Review, Vol. XXIII, No. 2, April 1936. Pp. 149-172.

Fong, Theodore C., senior medical officer:

The Treatment of Neurosyphilis. The Military Surgeon, Vol. 78, No. 6, June 1936. Pp. 449-456.

The Diathermy Treatment of Dementia Paralytica. Medical Record, May 6, 1936. Pp. 286-288.

Abrams, Alfred L., junior medical officer:

Epidemic Poliomyelitis in Washington. Medical Annals of the District of Columbia, Vol. V, No. 5, May 1936. Pp. 126-130.

Richmond, Winifred V., psychologist:

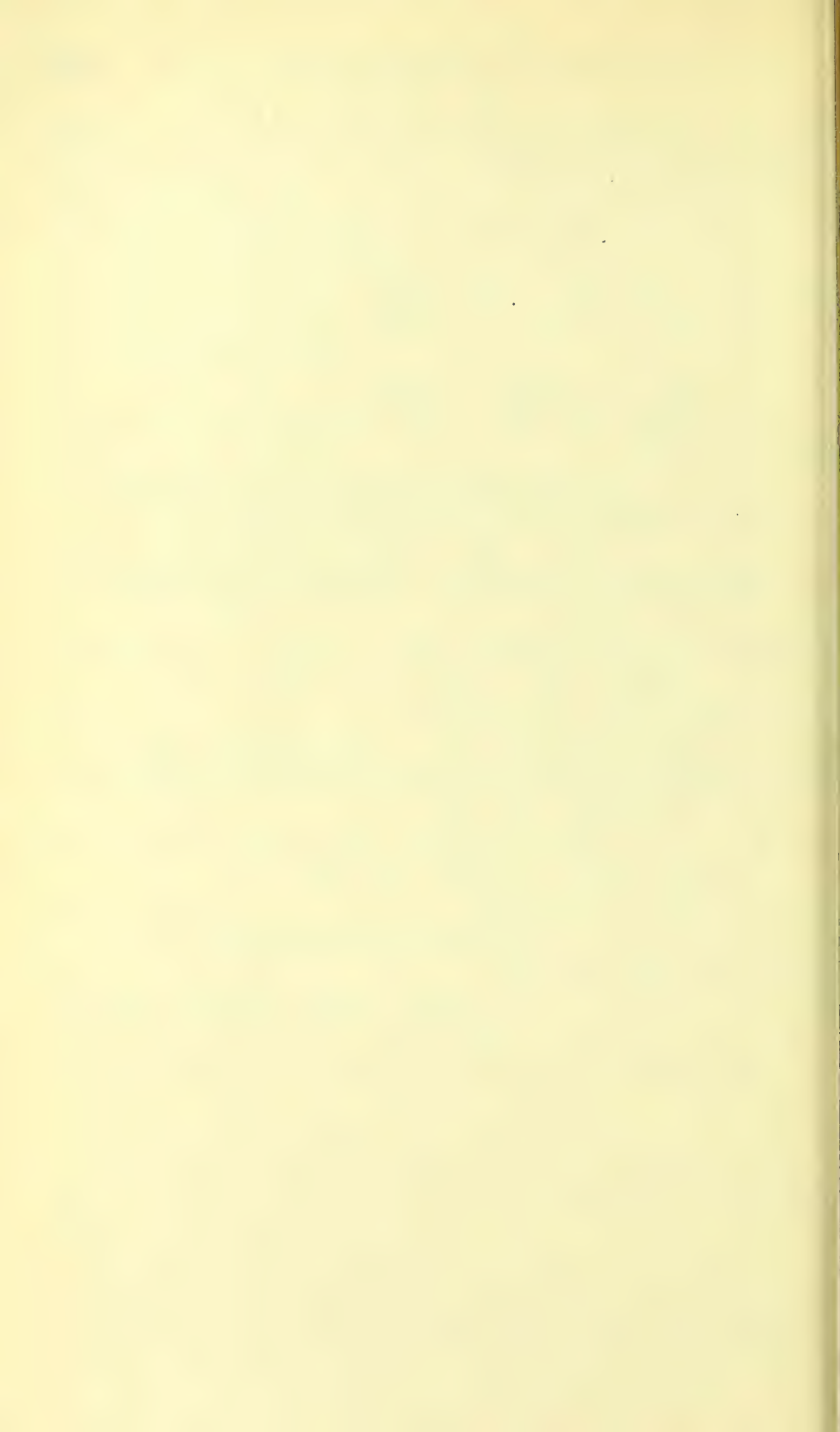
An Introduction to Sex Education. (English edition with preface by Kenneth Walker.) London, Jonathan Cape, 1936, 285 pages.

Ashby, Winifred M., bacteriologist:

The Preservation of Entigenic Specificity in Sheep Corpuscles. Journal of Laboratory and Clinical Medicine, Vol. 21, No. 9, June 1936. Pp. 943-948.

Sanger, Monie, assistant to the superintendent:

Modern Housing of Mental Patients. (With William A. White.) Modern Hospital, Vol. 45, July 1935. Pp. 42-47.



HOWARD UNIVERSITY

(MORDECAI W. JOHNSON, *President*)

GENERAL TRENDS

1. *Increased enrollment.*—Forty-one States and 13 foreign countries sent 1,970 students to Howard University during the school year 1935-36, and 245 graduates were sent out from the graduate school, the college of liberal arts, the school of engineering and architecture, the school of music, the colleges of medicine, dentistry and pharmacy, and the school of law. Enrollment continued on the increase, showing a gain of 63 for the year and a gain of 344 or 21 percent since 1933-34, when the number of students reached the bottom of the depression trough.

2. *Advancing center of graduate education.*—The graduate school again showed increased enrollment, bringing students from 38 colleges and universities in 30 States and 5 foreign countries; medicine and law received freshman classes with 85 percent and 83 percent of their students, respectively, of graduate status; religion graduated its last class of college students and advanced to a wholly graduate enrollment. Twenty-one and five-tenths percent of the entire enrollment of the university was of graduate caliber.

3. *Major service to the South.*—Eighty-two and two-tenths percent of all graduate enrollment and 75 percent of all the enrollment came from the South, the States of the Negro's majority residence and greatest educational need.

4. *Following up the graduates.*—The university now has 9,782 graduates at work in 43 States and 24 foreign countries. Names and addresses are classified by class, by school, by city, by State. The registrar of the university with the help of National Youth Administration funds, is making a study of the economic status of these graduates, for report and review by the United States Office of Education.

5. *Progress in number and salaries of full-time teachers.*—The full-time teaching staff of the university showed an increase of 40 percent over the full-time staff of 10 years ago and was in charge of 83 percent of all instruction. The faculties of medicine, law, and religion, however, were still in need of increased full-time personnel to meet the minimum requirements of instruction and the liberal arts college faculty anticipated the need of additions to personnel

in 1937-38 to meet the rise in enrollment and the increase of graduate work. The teaching staff had but slightly passed the halfway mark in maturity, however, there being a manifest need for 30 mature teachers in the professorial rank. The salaries of teachers had passed the minimum agreed upon 10-year-program figures and were approximating the agreed upon average, except in the professorial rank, where 10 teachers were still below the minimum and the average annual salary was far from the agreed upon figure. In numbers and in salary, the university was still heavily disadvantaged at the most important point in its work, namely, the mature teaching staff in the professorial rank.

6. *Increased scholarly activity and publication.*—The Journal of Negro Education finished its fifth year of service with increased prestige. The teachers were more active than ever before in learned societies and published during the year 9 books and monographs and 138 scholarly articles, many of them representing creative contributions to knowledge. Their eagerness for improved abilities continued to be one of the most inspiring elements of the university life, 18 members, or 11 percent of the staff, being away on leave of absence or on fellowships for further study.

7. *New educational ventures succeed.*—The school of engineering and architecture passed successfully through its second year of independence, with increased enrollment, and with all of its graduates employed.

The dental college successfully carried through its second year of work in the preparation of oral hygienists. The graduates uniformly met the requirements for licensure in every State wherein they underwent examination, but the percentage of employment was low. The trustees inaugurated on the graduate level courses for the preparation of professional social workers. Twenty-four students were enrolled and were served by eight teachers.

8. *Medicine receives \$160,000 grant and takes forward steps in clinical teaching.*—The college of medicine received a grant of \$100,000 from the General Education Board to provide able temporary leadership in the departments of medicine and surgery, pending the training and placement of permanent personnel. Facilities for the clinical teaching of medicine were greatly improved by the establishment of a tuberculosis clinic at the Freedmen's Hospital by the Health Department of the District of Columbia and the extension of facilities for the study of contagious diseases at the Gallinger Hospital. The General Education Board continued to provide fellowships for the further training of teaching personnel.

9. *School of law moves to main campus.*—The school of law moved from its downtown location to adequate and very promising quarters

on the university campus and experienced an unprecedented increase in the number and quality of its first-year class.

10. *Two new buildings about ready and two more on the way.*—The chemistry building, made possible by the appropriation of \$626,300 by the Public Works Administration, was completed. The equipment and furniture were being installed, and it was estimated to be ready for occupancy in September 1936. The appropriation for the new university library had been restored from impoundment, and specifications were being revised and printed for proposals. The new heat, light, and power plant, made possible by an appropriation of \$555,577 by the Public Works Administration, was nearly completed and was undergoing trials in the production of heat and power. The architect's contract for the new men's dormitories, to be erected from a Public Works appropriation of \$525,000, had been drawn and was waiting the approval of the Secretary of the Interior.

11. *Increased income and expenditures.*—While the total income of the university during the year showed a decrease of \$52,467.69, the income for current purposes showed an increase of \$36,905.89. Expenditures were carefully budgeted, but with the most thoughtful economy expenditures exceeded income by \$1,364.98. There was an increase in the amount and percentage of current funds used for resident instruction and the general library, a reduction in the percentage of funds spent for general administration and for athletics. In the matter of resident instruction and the general library the percentages approximated those planned in the 10-year program.

12. *Increased scholarship and student aid.*—Seven and one-half percent of all student fees were again devoted to scholarship and student aid. The university funds, with the help of the National Youth Administration, were able to provide urgently needed aid for a 25-percent increase in the number of students helped in the undergraduate and graduate schools and approximately 100-percent increase in the number of students given help in the professional schools.

13. *General appraisal of advance in a perspective of 10 years.*—The improvement which has taken place at Howard University during the past 10-year period as the result of the planned cooperative support of Government and private philanthropy has been the most constructive and inspiring event in the current education of the Negro people. This has been true because appropriations and gifts have been made with the obvious purpose of establishing a first-class institution in both personnel and equipment. While the work has been forwarded in the matter of capital buildings during the last 3 or 4 years, it has not received the needed increase of support in current funds for personnel, books, and maintenance. Urgent need now appears in these items of support.

14. *Outstanding needs.*—The outstanding needs of the university are (1) 30 mature teachers in the professorial rank; (2) increased scholarship funds for undergraduate students and substantial increases in the number and size of fellowships for graduate students; (3) \$300,000 to double the gravely deficient book collection; and (4) increased funds for maintenance to check the depreciation of the plant which has set in as a result of the limited funds available during the depression.

STUDENTS

1. *Enrollment for the year 1935-6.*—The total enrollment of Howard University (see the table following) for the year 1935-36 was 1,970, of whom 1,072 were men and 898 were women, as compared with the total of 1,907 for 1934-35, of whom 1,008 were men and 899 were women. A net gain of 63 students, or 3.3 percent, is shown, as compared with a net gain of 281 students, or 17.3 percent, in 1934-35, and a net loss of 267, or 14 percent, in 1933-34.

2. *Geographical distribution.*—Ninety-five and two-tenths percent of the enrollment during the school year 1935-36 came from the continental United States, while 4.8 percent came from without the borders of the United States, as compared with 94.9 percent and 5.1 percent, respectively, during 1934-35. The percentage of candidates for degrees coming from the District of Columbia during 1935-36 was 28.7 percent, as compared with 27.2 percent for the year 1934-35.

Summary of students enrolled in Howard University for the years 1935-36 and 1934-35

Divisions of the university	Net enrollments							
	1935-36			1934-35			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
The colleges:								
College of liberal arts.....	1, 174	548	626	1, 156	547	609	18	-----
School of engineering and architecture.....	52	52	0	27	27	0	25	-----
School of music.....	55	20	35	60	24	36	-----	5
Graduate school.....	236	134	102	225	76	149	11	-----
Total.....	1, 517	754	763	1, 468	674	794	54	5
Professional schools:								
Theological college.....	8	7	1	11	10	1	-----	3
Graduate school of theology.....	19	18	1	13	13	0	6	-----
Law school.....	62	56	6	44	43	1	18	-----
School of medicine:								
College of medicine.....	142	135	7	168	161	7	-----	26
College of dentistry.....	38	37	1	35	34	1	3	-----
College of pharmacy.....	26	21	5	26	23	3	-----	-----
Total.....	295	274	21	297	284	13	27	29
Total in regular courses.....	1, 812	1, 028	784	1, 765	958	807	81	34
Special students in music, law, dentistry, religion.....	158	44	114	142	50	92	16	-----
Grand total (net).....	1, 970	1, 072	898	1, 907	1, 008	899	63	-----

Forty-one States sent 1,717 candidates for degrees in 1935-36, as compared with 39 States sending 1,675 candidates for degrees in 1934-35. The gain of 42 candidates is shown to have been shared by 21 States. The distribution of the regular enrollment of candidates for degrees, by divisions, is as follows: From the North, 415 students, as follows: New England, 60; the Middle Atlantic States, 245; the East North Central States, 72; the West North Central States, 38. From the South 1,294 students, as follows: From the South Atlantic States, 1,105; from the East South Central States, 98; from the West South Central States, 91. From the West, 8 students, as follows: From the Mountain States, 2; from the Pacific States, 6.

3. *Students of advanced standing*.—Eighty students from fifty-seven institutions entered the college of liberal arts, the school of engineering and architecture, and the school of music with advanced standing. Seventy-nine of the one hundred and twenty students entering the professional schools for the first time during the year 1935-36, or 66 percent, were equipped with 4 years or more of college training. Of the 1,970 students in the entire institution, 424, or 21.5 percent, were persons holding one or more academic degrees.

4. *Scholarship and student aid*.—The trustees of Howard University continued to set aside 7½ percent of all student fees as a special scholarship fund for needy students. They also made provisions for increased work opportunities for students, and continued the use of the installment system of fee payments. The National Youth Administration awarded aid averaging \$15 per month to 9.6 percent of the full-time student body. Through these several means 407 students in the undergraduate colleges received some assistance during the course of the academic year, as well as approximately 62 students in the graduate school and 122 students in the professional schools. Scholarships and student aid were awarded to students in the order of their scholastic standing. Support was thereby given to all other measures stimulating earnest scholarly work.

The committee on scholarships and student aid for the undergraduate colleges reports that for the year 1935-36 it acted upon 1,500 applicants, as compared with 1,400 the year before. Ninety-eight percent of these applicants were judged by the committee to be in actual need of financial aid. The resources of the university together with the assistance from the National Youth Administration, furnished aid for only 39 percent of the total number of applicants. The amount of scholarship and work aid available to the university is far below the present need.

GRADUATES

1. *Number and distribution.*—The following table exhibits the number of graduates from each division of the university during 1935-36, as compared with 1934-35. The table shows that there was a total of 245 students graduated during the year, representing a decrease of 30, as compared with the group of graduates in 1934-35. The percentage of male graduates was 47 in 1935-36, as compared with 53.7 in 1934-35, while the corresponding percentages of women graduates were 53 and 46.3, respectively.

2. *Honorary degrees.*—Three honorary degrees were conferred at commencement in June 1936. William Stuart Nelson, president of Shaw University, Raleigh, N. C., and president-elect of Dillard University, New Orleans, La., was awarded the degree of doctor of laws; Edward H. Morris, attorney, of Chicago, Ill., was awarded the degree of doctor of laws; and Richard Hausber Bowling, minister, First Baptist Church, Norfolk, Va., was awarded the degree of doctor of divinity.

3. *Number and distribution of graduates.*—The total number of graduates of Howard University is now 9,782. Of this number the registrar has 6,500 correct addresses in 43 States, the District of Columbia, and 15 foreign countries. These addresses are classified alphabetically, by States, by cities, by sex, by schools, and by classes. In cooperation with the United States Office of Education, the registrar of the university is now making a careful study of the economic status of these graduates.

*Summary of students graduated by Howard University for the years
1935-36 and 1934-35*

Division of the university	Graduates							Gain	Loss
	1935-36			1934-35					
	Total	Men	Women	Total	Men	Women			
The colleges:									
College of liberal arts	132	38	94	144	55	89	-----	12	
School of engineering and architecture.....	6	6	0	0	0	0	6	-----	
School of music.....	3	2	1	5	1	4	-----	2	
Graduate school.....	45	20	25	38	13	25	7	-----	
Total	186	66	120	187	69	118	13	14	
Professional schools:									
Theological college.....	4	3	1	2	2	0	2	-----	
Graduate school of theology.....	3	3	0	4	4	0	-----	1	
Law school.....	4	4	0	10	10	0	-----	6	
School of medicine:									
College of medicine.....	35	33	2	55	53	2	-----	20	
College of dentistry:									
4-year course.....	5	5	0	2	2	0	3	-----	
Dental hygiene.....	6	0	6	8	0	8	-----	2	
College of pharmacy.....	2	1	1	7	7	0	-----	5	
Total	59	49	10	88	78	10	5	34	
Grand total (net).....	245	115	130	275	147	128	-----	30	

TEACHING STAFF

1. *Number and distribution of teachers.*—There were 264 members of the teaching staff during the school year 1935–36, of whom 133 were full-time and 131 were on part-time, representing together a full-time equivalent of 160 teachers, as compared with a total of 241 members of the teaching staff during the year 1934–35, of whom 134 were on full time and 107 were on part time, representing together a full-time equivalent of 156 teachers. This represents a loss of 1 full-time teacher and a gain of 24 part-time teachers—a net full-time equivalent gain of 4 teachers.

2. *Number of teachers in relation to the 10-year program.*—In the 10-year program for Howard University agreed upon by the Government, definite objectives were determined in regard to the ratio of the students to teachers in each division of the university. The status of our progress in relation to these objectives continues to be favorable, but is not fully satisfactory and is in imminent danger of being thrown far out of balance by increasing enrollment, if concurrent increases in staff are not made. When the depression caused the enrollment of the university to drop in the years from 1931–32 to 1933–34 the university reduced its staff by 44 members, 30 of whom were full-time teachers. In the 2 years 1933–34 to 1935–36 enrollment has increased by 344 students, from 1,626 to 1,970, with commensurate increase in the teaching load. During this 2-year period, however, the university has been able to make no net additions to the full-time staff, and such part-time additions as are the equivalent of only six full-time teachers. The consequence is that while the teaching staff in the college of liberal arts is adequate for the undergraduate load, in most departments, it is pressed to the limit of its resources to meet the added graduate load of 242 students. Six teachers are now bearing loads of from 16 to 19 hours and there are 50 classes above 30 in numbers. This college will be urgently in need of additions in 1937–38 to meet an enrollment further increasing toward normal.

In engineering and architecture the ratio of teachers to students is favorable, but the nature of the subject matter is such that 5 teachers are bearing loads of from 16 to 19 hours. In music the ratio is favorable, but an additional teacher specializing in the history and appreciation of music is required to meet the needs of the undergraduate college students.

The faculty of medicine has made great progress in providing able teachers for its preclinical branches and needs only to fill a few gaps. But in all the clinical branches there is urgent need of additional teachers, particularly now in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. The Rockefeller

Foundation and the General Education Board, already so greatly helpful in the matter of preclinical teachers, have appropriated \$100,000 to provide the temporary leadership of highly competent men in medicine and surgery, while the university selects, trains, and places the additional personnel needed.

The faculties of dentistry and pharmacy are adequate in number and are prepared to teach a much larger enrollment. Law has a full-time faculty of minimum adequacy, but needs at least one additional full-time teacher. The very nature of subject matter in religion requires an increase of from three to five full-time teachers.

3. *Full-time teachers.*—One of the major problems confronting the university has been to overcome the heavy preponderance of part-time teachers in many branches of knowledge, who do their university teaching as a supplement to active vocation elsewhere. Improvement in this respect has been markedly steady and gratifying. In 1925-26, with an enrollment of 2,213 students, the university had only 79 full-time teachers. In 1935-36 the university had 133 full-time teachers, and they were offering 83 percent of all instruction. While it is desirable to retain many part-time instructors for specialized services, it is necessary further to increase the number and preponderant weight of full-time personnel in medicine, law, and religion.

4. *Maturity of the staff.*—Of the 160 (full-time equivalent) teachers on the staff this year 32.8, or 20 percent, were professors; 24, or 15 percent, were associate professors; 27, or 16 percent, were assistant professors; 61, or 38 percent, were in the rank of instructor and below. On the basis of the 10-year program of development, our present staff should have a distribution as follows: 64 professors, or approximately double the present number; 16 associate professors; 32 assistant professors; and 48 instructors. The full professorial staff is still seriously undermanned. The disparity in maturity is not as great as the figures would show, however, for with the help of the Julius Rosenwald Fund, the Rockefeller Foundation, and the General Education Board the university has given opportunity for further training to more than 100 members of the staff, for periods of from 1 to 3 years in the best universities of America and Europe. Several of these teachers, now mature and very able, are in the associate and assistant professorial rank, awaiting advancement which has been long delayed for lack of adequate funds.

5. *Salaries of teachers.*—In the 10-year program of development for Howard University the minimum, average, and maximum salary scales for the teaching personnel were definitely fixed. The salary situation for full-time teachers at Howard University at June 30, 1936, was as follows: The average instructional salary had reached \$1,916 which is \$184 below the average of \$2,100 agreed upon in

the 10-year program. The average salary for full-time assistant professors had reached the level of \$2,684 which is \$152 below the average of \$2,800 agreed upon in the 10-year program. The average associate professor's salary had reached the sum of \$3,446 or \$54 below the average salary agreed upon. Fully 10 full-time professors, however, were still receiving less than the minimum salary of \$4,000 agreed upon in the program and the average professor's salary was \$4,078 or \$808 below the average of \$5,000 agreed upon in the program.

Here we place our finger upon the strategic center of further improvement. All able men in the field of education are agreed that competence in instruction depends primarily upon an adequate number of mature and able teachers with salaries adequate to assure their full-time attention to their work. Howard University needs (a) to advance the salaries of the men in its professorial rank, (b) to bring into that rank, by advancement, the worthy teachers who are prepared to do its work, and (c) to supplement their numbers by an adequate selection of additions from the ablest men available. This work is, in the nature of the case, slow of accomplishment, but it should go steadily forward year by year.

GRADUATE SCHOOL

1. *Summary of general trends.*—The graduate school, in its second year as a separate school of the university, experienced an increase of 16 in enrollment, an increase in the number of students giving full time to their studies, and an increase of 7 in graduate degrees awarded. While the school drew its enrollment from 38 institutions and 30 States and 5 foreign countries, 90 percent came from institutions for Negro youth and 82.2 percent from 17 Southern States—the place of greatest educational disadvantage on the graduate level and with the greatest need. Instruction was offered in 17 departmental faculties, including for the first time social work and bacteriology. Three-fifths of the students showed a preference, however, for education and the social sciences. The biological and physical sciences and mathematics were elected by approximately one-seventh of the students and drew one-fifth of the degrees awarded. In all departments offering graduate instruction the ratio of teachers to students was approximately such as to make possible thoughtful, individual attention to the student. There was also a good proportion of able teachers with ample preparation and experience. Twelve of the departments produced scholarly publications during the year, much of which represented independent contributions to knowledge. Nearly all of the departments, however, were handicapped by the inadequate salaries of the mature teachers, by grave deficiencies in

the university book collection, and by the shortage of funds for research.

2. *Enrollment.*—The total enrollment of the graduate students for the year was 242, as compared with 226 and 164 for the 2 preceding years, respectively, representing a net increase of 58 over the enrollment before the graduate school was independently organized, and an increase of 48 over the prior peak enrollment of graduate students in 1931–32.

3. *Scholarship and student aid.*—Applications sent to the graduate school indicated that nearly all prospective full-time students were in need of financial aid. The university undertook to meet this need as far as possible with the help of the National Youth Administration. Aid was given to the total value of \$11,280. The number of students helped was 50 and 63 during the 2 semesters, respectively. The margin of unhelped need was very great.

4. *Social work.*—In accord with the vote of the trustees, a department of social work was organized in the graduate school, under the direction of the head of the department of sociology. Twenty-four students enrolled for the course, under the instruction of eight teachers. Two of the teachers were from the faculty of the school of medicine.

5. *Graduate degrees conferred.*—Forty-five graduate degrees were conferred upon 20 men and 25 women, as compared with 38 degrees for the previous year. Thirty-two graduates received the degree of master of arts, and 13 the degree of master of science.

6. *Solid foundations for the future.*—The steady growth in enrollment has demonstrated that graduate work at Howard University is developing to meet a real and growing need. This need is based upon the obvious lack of graduate educational opportunity for Negro citizens in the States of their majority residence, while the development of elementary, high-school, and college educational facilities is steadily increasing and making urgent demands for teachers of graduate training. It is a matter of major interest to those States and to the entire Nation that there shall grow up here with the help of the Federal Government an institution which offers this work on a sound and thoroughly competent basis to young men and women selected for their great promise and who are provided with the means to study.

If this sound foundation is to be assured, the university must have substantially increased funds for the following purposes: (1) For improvement of the salaries of mature teachers and for an increased number of them; (2) for a doubling of its book collection within 5 years; (3) for scholarships and fellowships; and (4) for at least that minimum of research which is necessary to maintain a living mind in the members of the staff.

THE COLLEGE OF LIBERAL ARTS

1. *Proposed new plan of study.*—During the year a committee, after careful planning over a period of more than 1 year, presented to the faculty a report embracing a new plan of study for the college.

2. *Students.*—The student registration during the current year was 1,175, of whom 548 were men and 626 women. These were distributed by departments as follows: Art, 115; botany, 88; chemistry, 249; commerce and finance, 170; economics, 101; education, 617; English, 803; freshman orientation, 84; German, 216; history, 534; home economics, 201; Latin, 32; mathematics, 178; military science and tactics, 284; philosophy, 77; physical education for men, 165; physical education for women, 307; physics, 114; political science, 194; psychology, 327; romance languages, 245; sociology, 135; and zoology, 162.

3. *Graduates.*—During the academic year 132 degrees were conferred, as follows: 33 bachelors of arts, 18 bachelors of science, 4 bachelors of science in commerce, 50 bachelors of arts in education, 17 bachelors of science in education, 9 bachelors of science in home economics, and 1 bachelor of science in art.

4. *Faculty.*—There were 91 members of the faculty of the college of liberal arts during the academic year 1935–36. Of these, 32 were professors, 15 associate professors, 15 assistant professors, 32 instructors, and 7 assistants. Thirty-five have the degree of doctor of philosophy. It is gratifying to note an increase in the scholarly activities of the faculty. A list of their publications during the year 1935–36 covers 11 typewritten pages.

5. *Special lecture series in the social sciences.*—During the year the division of social sciences sponsored at the university a series of six lectures on the general subject of "The Crisis of Modern Imperialism in Africa and the Far East." Alert and educated natives of Asia and Africa, as well as distinguished persons from American universities and from public life, were included among the speakers.

6. *The drama and the debate.*—A worthy development during the year 1935–36 was the setting up of a little theater in the north basement of Douglass Hall. Through initiative and industry on the part of the director and players, maximum use was made of very uninviting equipment. Several plays were presented on five different occasions.

During the year nine public debates were held between the students of Howard University and those of eight other colleges in various sections of the country.

7. *New building facilities.*—The faculties and students this year enjoyed the first full year's use of the new classroom building, Douglass Hall. In its ample space and equipment for classes, for teachers, administrative officers, and for small assemblies, and in its rest and

comradeship rooms for teachers and students, the building proved a superior blessing.

8. *Needs*.—Among the needs of the college are the following: Repair and remodeling of Thirkield Hall to serve adequately the needs of the departments of botany, physics, and zoology; a home-economics practice cottage; additional teachers in education, German, physical education for women, political science, and Romance languages; and staff assistants in political science and chemistry.

MILITARY SCIENCE AND TACTICS

1. *Rating*.—For the third successive year the Howard University R. O. T. C. bears in the rating of "excellent" as a result of formal inspection during the spring of 1936 by Maj. Charles D. Carl, acting assistant adjutant general, Third Corps Area. The following extracts are from the report of inspection under date of June 17, 1936:

This R. O. T. C. unit has attained the War Department objective.

The earnestness and enthusiasm displayed by the members of this unit deserves special mention. Both in the classroom and on the drill field, their attitude is extremely commendable, and contributes greatly to the excellent results being attained.

General rating of the unit, "excellent." By command of Major General Bowely.

2. *Enrollment and teaching staff*.—The enrollment in military science and tactics during the year 1935-36 was 291 the first semester, 276 the second semester, or an average of 283—and an increase of 15 over the average of 268 last year. This enrollment was divided as follows: First semester, basic students, 245; advanced students, 46; second semester, basic students, 228; advanced students, 48. These students were taught by a staff of four members.

3. *Commissions awarded*.—Twenty students were awarded commissions as second lieutenant in the Reserve Corps of the United States Army.

SCHOOL OF ENGINEERING AND ARCHITECTURE

1. *Trends*.—The vigorous activity of the Federal Government on engineering and architectural projects and the concurrent employment of an increasing number of Negroes on projects of this character have strengthened all factors which tend to encourage the type of education offered by the school of engineering and architecture. The school has had a larger enrollment this year than at any time during the history of the university's work in this field.

2. *Enrollment*.—Thirty-nine students enrolled the first semester of the year 1935-36 in engineering and architecture and 48 registered for the second semester. Of this number, 27 were freshmen. The

enrollment at the beginning of the second semester represented an increase of 90 percent over the enrollment for the second semester of 1934-35, and exceeded by 15 percent the highest enrollment at any time during the 25 years in which the university has offered instruction in engineering and architecture.

3. *Graduates*.—Six students earned degrees in engineering and architecture in June 1936 as follows: B. S. in architecture, one; B. S. in civil engineering, two; B. S. in electrical engineering, two; and B. S. in mechanical engineering, one. All of the graduates secured immediate employment. This school now has 64 graduates in the field, as follows: Architecture, 12; civil engineering, 3; electrical engineering, 25; mechanical engineering, 24. The school maintains a bureau of technical information which serves to place its graduates and to promote the employment of Negro technical talent throughout the Nation.

4. *Teaching staff*.—The faculty consisted of eight members: One associate professor, three assistant professors, and four instructors, all of whom were full-time teachers. This staff offered 40 courses of instruction during each of the 2 semesters.

5. *Rating and inspection of school*.—The Engineers Council for Professional Development, the accepted agency for the accrediting of colleges of engineering, is now making an inspection of Howard University school of engineering and architecture.

6. *Needs*.—In his annual report the dean of the school summarizes the needs of the school as follows: (1) More space for teaching purposes, to be provided by transfer of the art department now housed in the building; (2) two additional teachers—an instructor in architecture and an instructor in engineering; (3) many items of scientific equipment in all divisions of the work.

SCHOOL OF MUSIC

1. *The work of the school of music*.—The school of music at Howard University offers degree courses in piano, public-school music, organ, and violin and maintains a junior department for the purpose of developing a large group of students with sound basic training in music. It also offers courses in the history and appreciation of music and other instruction in the several departments to students in the college of liberal arts and in other divisions of the university.

2. *Number and distribution of students*.—The school enrolled during the year 197 students, as compared with 187 students in the year 1934-35 and 140 students in 1933-34.

3. *Faculty*.—There were 12 members of the faculty of the school of music for the year. Eight of these were rendering full-time

service and four were rendering part-time service. Two were professors, two assistant professors, six instructors, and two part-time assistants.

4. *Graduates*.—Three students were graduated at commencement. Two of these received the degree of bachelor of school music and one received the degree of bachelor of music with organ as a major.

5. *Needs*.—This school needs a teacher of history and appreciation of music for service primarily to the undergraduate students in the college of liberal arts. It also needs two parlor grand pianos, five upright pianos, one practice organ, one double bass, and one viola.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the university without superseding the direct lines of authority from the independent faculties to the board of trustees. The autonomous member units are the college of medicine, the college of dentistry, and the college of pharmacy. Freedmen's Hospital, a Government institution, built upon grounds leased in perpetuity to the Government by the university, provides clinical facilities for the university medical unit.

COLLEGE OF MEDICINE

1. *Outstanding events of the year*.—The outstanding events of the year 1935-36 are as follows: (1) A grant of \$100,000 by the Rockefeller Foundation to be used over a period of the next 5 years for the development of the departments of medicine and of surgery; (2) the establishment of a tuberculosis clinic at the Freedmen's Hospital by the Department of Health of the District of Columbia with the understanding that this clinic shall be available to Howard University medical students for teaching purposes; (3) the extension of clinical teaching of acute contagious diseases to Howard University medical students at the Gallinger Hospital under supervision of Dr. Alonzo DeG. Smith, associate professor of pediatrics; (4) a grant of \$3,910.75 by the Wisconsin Alumni Research Foundation to finance a study of acute rickets under direction of Dr. Alonzo DeG. Smith.

2. *Students*.—There was a total enrollment of 142 students in the college of medicine during the school year 1935-36, as compared with 168 during the previous year. There were 222 applicants for admission. Of these 142 presented minimum premedical qualifications, 54 were issued permits to register, and 39 actually entered the freshman class. Of these new entrants 33, or 85 percent, had 4 years or more of previous college training.

3. *Instruction*.—During the year instruction has been furnished to students from the following schools and colleges of the university and from the Freedmen's Hospital: Medicine, 143; dentistry, 38; dental hygiene, 9; pharmacy, 26; liberal arts, 53; nurses, 38; grand total 308.

4. *Graduates*.—The degree of doctor of medicine was conferred upon 35 graduates at the June commencement. All secured internships in hospitals approved by the council of medical education and hospitals of the American Medical Association. Fifty-five Howard medical graduates were examined by 16 different State boards in the United States and Possessions during the year. Fifty passed, and five failed. The percentage of failures was 9.1 as compared with 11.1 the previous year.

5. *Officers of instruction*.—There were 113 officers of instruction in the college of medicine during the year, of whom 19 were rendering full-time service and 94 were rendering part-time service, together being estimated as the equivalent of 32.62 full-time teachers. We report with deep regret the loss of three of the faculty by death. The college of medicine was represented by members of the faculty at the following scientific meetings during the year: (1) The Federation of American Societies for Experimental Biology, (2) the American Association of Anatomists, (3) the American Association of Physical Anthropologists, (4) the American Association for the Advancement of Science, (5) the Association of Pathologists and Bacteriologists, and (6) the Eldridge Reeves Johnson Foundation for Medical Physics.

6. *Interschool and hospital relations*.—The year 1934-35 marked the first year for residencies in Freedmen's Hospital. This year, 1935-36, one resident in pediatrics and one in obstetrics-gynecology were appointed to the Freedmen's Hospital, by the Surgeon-in-Chief, effective October 1, 1935. For the coming year, beginning July, the Department of the Interior has approved the appointment of one resident in medicine and one in surgery. As a result of the grant made by the Rockefeller Foundation, the university has found it possible to make available a stipend of \$500 to both these new residents. The introduction of residents into the Freedmen's Hospital will greatly improve the medical care of patients and in time will make possible certain needed improvements in clinical teaching.

7. *Needs*.—(1) Additional teaching personnel. Although the pre-clinical staff of the college of medicine is still incomplete at several important points, the principal problem to be solved in the immediate future is the development of the clinical staff. In the preclinical

departments, additions to the staff are urgently necessary in the departments of anatomy, pharmacology, biochemistry, and in the division of public health. In the clinical departments, only the beginning has been made in medicine and in surgery. We are greatly in need of additional teachers in all the major clinical departments. Additional teachers are particularly needed in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. (2) The clinical material for teaching, in the Freedmen's Hospital, is still inadequate in amount in some services, and in variety in all services. Facilities are still lacking for efficient teaching of clinical neurology and psychiatry. (3) With reference to physical equipment the following needs are urgent: (a) Larger and better equipped animal quarters, (b) the expansion of the lecture room in pathology, (c) the remodeling of the west pathological laboratory, (d) the equipment of the rest rooms for women and for men, and (e) additional staff space in the medical library.

COLLEGE OF DENTISTRY

1. *General trends.*—The dean of dentistry reports the best year since the beginning of his administration 5 years ago. There was increased enrollment of students. There was increased quality and scope of clinical cases. There was marked increase in the quality of student scholarship. Faculty members worked together with high esprit de corps. A vigorous movement toward further graduate preparation appeared among the faculty. Dental alumni manifested eager interest in the work. The class of 1926 returned for reunion and pledged an annual scholarship.

2. *The enrollment.*—The enrollment in the college of dentistry for the year was 47, as compared with 44 in 1934-35 and 41 in 1933-34. Nineteen of these were new students including 9 dental hygienists.

3. *Improvement in scholarship.*—It is the opinion of the faculty that the students as a whole have achieved more and have done a better grade of work than any student group in a period of 7 years. This was especially true of juniors and seniors whose work is largely clinical and is graded on the basis of quantity as well as quality.

4. *Graduates.*—Five graduating students were awarded the degree of doctor of dental surgery at the June commencement. Six students were awarded certificates in oral hygiene. A very encouraging thing for our graduates is the increasing number of internship awards open to those who have excelled in scholarship, character, and promise. The following have been annually available: The William A. Forsyth postgraduate internship, the Murry and Leonie Guggenheim postgraduate internship, and the Freedmen's Hospital internship. Other internship opportunities are available also from time to time.

5. *Oral hygiene*.—The department of oral hygiene has completed its second year. The graduates in this department uniformly met the requirements for licensure in the District of Columbia and the various States, but the percentage of employment was low. With a view to heightening the employment percentage, the college of dentistry has established a placement bureau.

6. *Faculty*.—There were 14 members of the faculty during the year, distributed as follows: 2 associate professors, 2 assistant professors, 9 instructors, and 1 assistant.

7. *The needs of the dental college*.—The dental college is in urgent need of further improvement. A small Public Works Administration appropriation is available toward this purpose and the work will proceed during the summer. The college further needs 22 new dental units and an autoclave sterilizer to supplement and partly to replace badly outworn and inadequate equipment.

COLLEGE OF PHARMACY

1. *Organization and general trends*.—The college of pharmacy began the year 1935-36 for the first time with the full 4-year curriculum in operation as adopted by the American Association of Colleges of Pharmacy, leading to the degree of bachelor of science in pharmacy.

2. *Registration*.—Twenty-six students registered for classes at the beginning of last year, 10 of whom were freshmen. Four of the entering classes were granted tuition scholarships. A number of qualified applicants were unable to enter because of financial need.

3. *Graduates*.—There were three graduates from the college of pharmacy who received the degree of bachelor of science in pharmacy. One of these was a graduate from the 3-year course who returned for the 4-year course and the bachelor of science degree. Several of our graduates have specialized in the purely professional practice of pharmacy in Virginia, West Virginia, Missouri, and Kansas. Reports indicate they are meeting with success.

4. *Faculty*.—We greatly regret to report the death of one member of the staff. The faculty for the coming year will be one vice dean, who is also professor of pharmacy; one professor of pharmacognosy department, two instructors in pharmacy, full time, and one instructor in pharmacy, part-time.

5. *Equipment and library*.—The scientific equipment of this college is now considered by the dean to be adequate and favorably comparable to that of other small colleges. Improvements and additions are being made annually as needs require.

The library of pharmacy is now combined with that of medicine. About 50 books have been added this year.

SCHOOL OF LAW

1. *Trends*.—The school has moved from its old and distressingly inadequate quarters on Fifth Street NW., to a much better building on the main campus of the university. Its enrollment has increased in numbers and in quality. Its library facilities are still growing, but too slowly. Its faculty meets the minimum requirements of the American Association of Law Schools, but has insufficient full-time members.

2. *Enrollment*.—The total enrollment of the school for 1935-36 was 62 as compared with 44 in 1934-35 and 37 in 1933-34. The present enrollment represents 23 States as compared with 17 States represented in 1934-35. It represents 29 undergraduate institutions as compared with 11 for 1934-35. Of the total enrollment 42 were new students, 35 of whom, or 83 percent, held the bachelor's degree or above. A majority of these entering students, moreover, were honor students in their respective colleges. One was a member of Phi Beta Kappa.

3. *Graduates*.—Four graduates received the degree of bachelor of laws degree in June 1936.

4. *Faculty*.—During 1935-36 the faculty consisted of six part-time teachers and four full-time teachers. There is urgent need of an additional full-time teacher of proven ability to place the school of law on a sound, full-time basis.

During the year the school had also six special lecturers.

5. *Library*.—During the year the Harvard University School of Law donated 238 miscellaneous volumes many of which are rare, some dating back as early as 1684. There were many other donors during the year who together made contributions of 913 volumes. Following is a detailed statement of the books now in the library:

Books as of June 30, 1936.....	15, 796
Books purchased, 1935-36.....	359
Books by gifts, 1935-36.....	913
Books by binding, 1935-36.....	29
Books lost and exchanged (lost 8).....	18
Books as of June 30, 1936.....	17, 079
Periodicals received by purchase.....	30
Periodicals received by gift.....	30
Circulation of books, 1935-36.....	2, 043

6. *Needs*.—The outstanding needs of this division of the university are: (1) Additional full-time faculty members (at least one more for 1937-38), and (2) increased funds for the binding, rebinding, and purchase of books and legal periodicals.

SCHOOL OF RELIGION

1. *Support*.—The school of religion received no support from Federal funds. Its work is maintained wholly by income from endowment and gifts from private sources.

2. *General trends*.—During the year 1935-36 the school of religion completed its passage through the period of transition by graduating the last members of the theological college.

3. *Enrollment*.—During the year 1936-37 the enrollment of the school for the first time will be composed altogether of students who have received the bachelor's degree or its equivalent from reputable institutions. This marks the completion of the first basic step in placing the school of religion on an entirely graduate basis.

4. *Faculty*.—The faculty suffered the loss of Dr. William Gordon, who for 14 years taught homiletics in the school of religion, and died June 5, 1936. He was highly respected and loved, and his loss will be difficult to sustain. One associate professor was on leave of absence during the year. There were three full-time teachers on the faculty and eight part-time teachers, representing a full-time equivalent of 6.20 percent.

Two members of the faculty published books during the year.

5. *Extension work*.—The eleventh annual ministers institute, held at Kinston, N. C., was one of the most helpful and constructive conferences in the history of the extension work of the school of religion.

As in years previous, the school of religion gave religious instruction to a group of Washington churches under the leadership of Dr. John Bentley. Many of the students served as assistant pastors and leaders in the churches of the District of Columbia and vicinity, and practically all Sunday speakers for the Maryland normal schools were supplied by the school of religion.

The thirteenth annual convocation of the school of religion was held in November. Men of national repute served as leaders and the convocation was well attended.

6. *Graduates*.—Seven students were graduated on June 5, 1936, three receiving the degree of bachelor of divinity and four the bachelor of theology degree.

UNIVERSITY LIBRARY

1. *Book and periodical collection*.—The total collection of books in the university is 99,005. During 1935-36 we accessioned 6,972 in the main library and a total of 8,270 in the entire university. The number of periodicals now received totals 592, representing 365 by the main library, 60 by law, and 167 by medicine. The total book collection at Howard University is greatly inadequate for an insti-

tution of this size and the rate of acquisition is too slow. The staff made a careful study of the adequacy of our book collection during the current year. This study shows that the library rates very low on holdings of books listed in various standard book lists and bibliographies. For example, we possess approximately 40 percent of the titles on the Charles B. Shaw list of selected books for an undergraduate college library and 58 percent of the selected titles of general cultural books in the Helen E. Haines bibliographies, from only one-tenth to one-third of the titles of works in the various classics in English literature, and only 8½ percent of the titles in Mudge's Standard List of Reference Books. The university needs a minimum of 200,000 books at a cost of \$300,000. It is hoped that a special book grant may be secured for a period of 5 years, so as to overcome this grave defect in our equipment.

2. *The University libraries.*—The total collections outside the main library now number 35,057 as follows: Medicine, 10,145; law, 17,076; religion, 1,443; engineering and architecture, 1,823; liberal arts departments, 4,570 (comprising: botany, 697; chemistry, 2,038; mathematics, 753; and physics, 1,082). A better coordination of these resources is much needed.

3. *The Moorland Foundation.*—This collection now numbers 9,992 items. One thousand three hundred and thirty-nine items were acquired during the year by purchase and by gift.

4. *Important needs.*—(1) Immediate erection of the long-delayed library building, (2) \$300,000 for book and periodical collection, (3) an enlarged staff, and (4) professional classification and salary scale for the staff.

BUILDINGS AND GROUNDS

1. *Two divisions of work.*—Work on the buildings and grounds of the university went forward during the year under two major divisions: (1) The regular university department of operation and maintenance, and (2) building construction work under the direction of the Public Works Administration, with a contract for each project.

2. *Special survey for improved organization service.*—To supplement internal surveys made by the superintendent of buildings and grounds and to further improvement in organization and work the trustees of the university secured the services of Mr. R. R. Linn of Muskegon, Mich., a specialist in the maintenance of buildings and grounds, to make a detailed survey of the organization and work of this department, with recommendations. The report has been received and clearly will be of great value to the university.

3. *Buildings under construction.*—The following table shows the list of building projects in process during the year ending June 30, 1936. These buildings were going forward under the funds and direction of the Public Works Administration.

Building projects in process, year ending June 30, 1936

No.	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building.....	May 4, 1929	\$626,300.00
5	Construction and equipment of a library building.....	Feb. 14, 1931	800,000.00
8	Construction and equipment of a heat, light, and power plant.....	Feb. 17, 1933	555,576.99
9	Construction and equipment of dormitories for men.....	Oct. 4, 1935	525,000.00

The status of the above listed projects at June 30, 1936, was as follows:

Project no. 2.—Chemistry building. Building completed. Equipment and furniture being installed. Estimated to be ready for occupancy in September 1936.

Project no. 5.—Library building appropriation restored from impoundment, February 7, 1936. Plans and specifications being revised and printed for proposals.

Project no. 8.—Heat, light, and power plant—project nearly completed. The first trial run was begun on April 2, 1936. Chief engineer and staff had been secured, and trial period was still in process.

Project no. 9.—Men's dormitories. The appropriation impounded early in the year 1936 was released by the Bureau of the Budget on June 11, 1936. Architect's contract was presented for approval of the Secretary of the Interior on June 13, 1936, and was awaiting his approval. Plans and specifications to be ready within 120 days from the date of the signature of the contract.

Needs.—By reason of the shortage of funds during the depression period, the interior painting of the buildings of the university and other important items of general repair are far behind schedule and in a distressing state. This department needs a minimum increase of \$50,000 in funds available for this purpose during the school year 1937-38.

FINANCES

The total assets of the university at June 30, 1936, were \$7,963,170.93, exclusive of the unexpended balances of Government appropriations for the chemistry building, the heat, light, and power plant, the library, and the men's dormitories. Of the total assets \$1,095,974.38 represents assets in the physical plant extension fund, made possible through private gifts from the General Education Board and the Julius Rosenwald Fund; \$910,012.36 represents en-

dowment; \$5,780,583.59 represents plant fund assets (an increase of \$683,183.90 since the last report), exclusive of the unexpended balances of Government appropriations for buildings, as indicated above. The remaining \$176,600.60 represents assets of the current fund.

The total income for the year 1935-36 was \$1,691,351.30, including current and capital funds. This represents a gross decrease of \$52,467.69 under the total income for 1934-35. The total income for current purposes, however, was \$1,024,118.60, or an increase of \$36,905.89 over the income for current purposes for 1934-35.

The total expenditures for all purposes, current and capital, were \$1,709,992.63, representing an increase of \$17,276.37 over the total expenditures for 1934-35. The total expenditures for 1935-36 were \$1,025,483.50, representing an increase of \$72,097.15 over the year 1934-35, and an excess of expenditures over the income by \$1,364.90.

While the peak expenditures of long appropriated Government funds for buildings temporarily throw a heavier percentage weight on the side of the Government in the total expenditures, the percentage of Government funds for current support is less than during the previous year.

The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress and by the Public Works Administration were expended under the supervision of the Secretary of the Interior.

FREEDMEN'S HOSPITAL

(W. A. WARFIELD, *Surgeon-in-Chief*)

Many difficult problems were encountered last year, arising principally from a shortage of personnel, particularly in the nursing department where the situation became so acute during the winter that it was necessary to close 1 ward of 28 beds in order to maintain a fair standard of nursing. The professional service rendered the patients and the results obtained were on the whole satisfactory.

PATIENTS

At the beginning of the year, there were 233 patients remaining from the preceding fiscal year. There were 4,830 admitted into the hospital during the year, making a total of 5,063 indoor patients under care. Of those remaining, 22 were pay patients, 74 indigent residents of the States, and 129 indigent residents of the District of Columbia. Of those admitted into the hospital, including births, 687 were pay patients, 1,600 were indigent residents of the States, and 2,540 were indigent residents of the District of Columbia.

There were discharged during the year, including births, 3,930 of whom 2,356 had recovered, 1,975 improved, 189 unimproved, and 307 died, leaving 234 in the hospital July 1, 1936, of which number 24 were pay patients, 79 indigent residents of the States, and 131 indigent residents of the District of Columbia.

Of the deaths, 26 were coroner's cases, 64 died within 48 hours after admission, and 34.1 percent were autopsied at the hospital. The mortality rate from all causes was 5.7 percent.

There were 2,035 surgical operations performed, of which 1,132 were major and 903 minor.

In the dental department 1,960 received care and treatment.

In the outpatient department 23,742 received treatment, of which number 8,816 were new cases. There were 6,537 emergencies. This department was greatly overcrowded and many persons could not be given the attention needed because of a lack of personnel.

NEEDS

As stated in the last annual report, the outstanding and most urgent need of the hospital is a larger personnel. It must be admitted that the care of the sick should be divided into three main

groups: (1) Physical equipment, to include housing apparatus, machinery; (2) sustenance, such as food, heat, medication; (3) service, which embodies personnel. Hospitals are classified according to their preparation to meet requirements along these lines, and the sick can be properly cared for only in proportion as the institution is equipped to meet their needs. The first two elements, physical equipment and sustenance, have been met fairly adequately; but the increase in personnel has in no degree kept pace with the steady growth of the hospital.

Our most glaring deficiency is in the nursing department where 16 additional graduates must be employed if the patients are to receive the best that medical science has to offer, and at the same time reduce the hours of duty for the nurses to a daily basis of 8 in accordance with standard requirements. For this, \$20,160 will be required.

Two social service workers should be provided without further delay. This part of the hospital service cannot function properly without these additional employees. The primary purpose of the hospital social service department is to further the medical social case study and treatment on an individual basis. It is recognized that the two workers now employed cannot carry on this important service in the manner desired, owing to the large number of applicants requiring attention. Three thousand six hundred dollars will cover this deficiency. An additional clerk should be employed in this department. It is only necessary to call attention to the 35,187 patients treated in the outdoor clinics during last year to emphasize the urgency for an additional clerk at \$1,440.

One additional orderly, at \$1,080, is required for the new clinic building. It has been an uphill struggle to keep this building of 40 rooms clean with one employee, whose time must be divided between serving physicians, directing patients to the various clinics, and keeping all rooms in a proper state of cleanliness.

Adequate appropriation for the foregoing personnel must be provided as a minimum requirement, or the hospital will be forced to continue operation, as heretofore, on a skeleton basis, and this at a time when the demand for service is most insistent.

COLUMBIA INSTITUTION FOR THE DEAF

(PERCIVAL HALL, *President*)

During the fiscal year July 1, 1935, through June 30, 1936, there were under instruction in the advanced department of the institution, known as Gallaudet College, 85 men and 60 women, a total of 145, representing 37 States, the District of Columbia, and Canada. This is an increase of eight as compared with the preceding year.

In the primary and grammar department, known as the Kendall School, there were under instruction 37 boys and 32 girls, a total of 69. This is a decrease of three as compared with the preceding year. Of the total in this department 67 were admitted as beneficiaries of the District of Columbia.

There were admitted to the institution 41 males and 27 females; discharged 36 males and 25 females.

HEALTH

Although a serious case of infection and three attacks of appendicitis requiring operation occurred during the year, all were successfully treated and general health was excellent. Modern preventive and protective methods are employed by our institution physician in medical care of the students and pupils.

COURSES OF INSTRUCTION

An additional course in educational psychology was added to the curriculum of the advanced department.

NEEDS OF THE INSTITUTION

A study of future building expansion has been made. This should include the following: New building to house library, printing office, laboratories, and recitation rooms; additions to the powerhouse, laboratory, and gymnasium; three complete units for housing and instructing the pupils of the Kendall School; and an additional cottage for permanent employes.

No additional buildings have been constructed for 18 years and the facilities for laboratory instruction are not modern. Dormitory space is badly crowded for both pupils and older students and the most pressing need at the present time is for relief in this respect.

The scale of salaries should be revised again in the near future to put them on the plane with those of similar workers elsewhere.

RESEARCH WORK

From time to time small grants of money have been arranged for to carry on research work in the institution. It is probably the finest field for this type of work in the world as the institution is located in Washington and covers a range of ages of students and pupils from 6 to 26. As the only institution in the world for the advanced instruction of deaf persons it is looked on as a center of information for other schools. Continuous research work should be carried on by regular employees. As a beginning one research worker with an assistant should be provided for in the near future.

RECEIPTS AND EXPENDITURES

The total receipts for the current operations for the fiscal year ending June 30, 1936, were \$181,253.36; total expenditures, \$178,716.63.

PRESENTATION DAY

On commencement day the degree of master of arts in the normal department was awarded to 8 graduates of other colleges and universities; 12 degrees of bachelor of arts and 11 degrees of bachelor of science were granted to the deaf graduates of advanced department. The honorary degrees of master of arts were conferred upon two well known teachers of the deaf, Miss Edith Mansford Fitzgerald and Miss Helen Bradshaw Fay.

THE ALASKA RAILROAD

(O. F. OHLSON, *General Manager*)

Gross operating revenues for 1936 were \$1,868,526.13, an increase of \$349,570.61, or 26.76 percent over the comparable figure for 1935. Operating expenses were \$1,888,934.30, an increase of \$331,371.12, or 21.27 percent, due to increased train service, also because of expanding the program of improvements and rehabilitation, consisting of ditching, bank widening, grade raising, ballasting, replacing wooden culverts with concrete pipe, placing rock to protect roadbed against erosion from rivers and streams, and making line changes to eliminate snowsheds.

The operating deficit amounted to only \$17,443.89, a reduction of \$56,230.77, or 76.3230 percent. The deficit figure includes an expenditure of \$27,121.81 made during 1936 for investigation of mineral and other resources, which amount, if deducted, would produce an operating profit of \$9,677.92, a most satisfactory improvement.

Passenger earnings in 1936 increased \$66,431.71, or 38.04 percent. Freight earnings for the year increased \$249,039.83, or 21.84 percent.

The rail-line revenue passengers in 1936 increased 19,771, as compared with last year, which was in part due to the increased tourist travel and in part to local travel between Anchorage and Palmer. Rail-line freight tonnage handled increased 41,796 tons, divided 19,145 tons to coal shipments and 22,651 tons to miscellaneous merchandise. The increase in freight tonnage is attributable to the result of improved business conditions.

The pay roll for 1936 amounted to \$1,572,454.25, an increase of \$233,628.98 over the previous year. Increased employment, necessitated by the greater volume of traffic handled, accounted for the greater part of the increase in pay roll, while a substantial part was due to the restoration of pay-roll deductions.

The more important additions and betterments consisted of placing 61,455 cubic yards of ballasting in main and branch tracks; placing of 6,359 cubic yards of riprap; relocating main line at mile 71.2 by constructing 1,700 feet of trestle which was filled with 101,662 cubic yards of gravel and 29,310 cubic yards of rock; replacing wooden bridges at Bird Creek and Kern Creek with 80-foot steel girders and cresoted pile trestles; construction of a new passenger and freight depot at Palmer; construction at Curry of an

18-room addition to the Curry Hotel, to be completed in July 1936; construction of a car-repair shed at Anchorage; extension to face of Seward Dock; construction of a new section house at Berg; construction of a warehouse at Holy Cross, to be completed in August 1936; construction of a 400-ton barge for river service; and the reconstruction of telegraph and telephone line for 30.8 miles.

Practically all of the mining camps adjacent to The Alaska Railroad, from Seward to Fairbanks and Yukon River points, were very active. These camps include the Moose Pass-Hope gold placer and lode, Girdwood gold placer and lode, Willow Creek gold lode, Nelchina gold placer, Yentna gold placer, Valdez Creek gold placer and lode, Broad Pass gold lode, Kantishna gold-silver-lead placer and lode, Bonnifield gold placer, Hot Springs gold placer, Fairbanks gold placer and lode, Livengood gold placer, Circle gold placer, Ruby gold placer, Innoko-Iditarod gold placer, and many other small scattered districts. The greater part of the increase in activity is in gold mining, and is due to the mechanization of old low-grade properties rather than to new discoveries.

Some of the outstanding new developments of the year were: The installation of a gold dredge in the Moose Pass-Hope district; the successful installation and operation of a gold-gravel washing plant in the Yentna district, which will stimulate the further use of similar types of equipment where special operating conditions exist; the continued development of a low-grade gold-lode property in the Broad Pass district, which, if successfully terminated, will invigorate the entire railroad area; the continued development of new gold dredging ground in the Fairbanks district; and the installation of a new gold dredge in the Circle district.

Coal was mined throughout the year in the Matanuska bituminous and Healy River lignite-coal fields. In addition to supplying fuel to all railroad points, 6,736.66 tons were shipped to nearby coastal towns.

The colonization project in the Matanuska Valley, which was started during May 1935, caused a heavy movement of passengers, construction material, and supplies to Palmer during the 1936 fiscal year. A traffic normal to what may be expected from a community of its size will rapidly be realized as the construction and development stages of the project are completed.

Outside of a reduction in revenues, as a result of completion of construction work at Palmer, it is expected that freight revenues in 1937 will closely approximate this year's totals. Passenger traffic is expected to increase, but with the present hotel facilities in the rail belt, including Mount McKinley National Park, being far from

adequate in comfortably providing for the present travel, the expansion of the tourist traffic presents a serious problem, and it is of vital importance that modern facilities be provided for the future.

The application of the Annual Leave Act of March 14, 1936, to the employees of The Alaska Railroad will substantially increase the operating expenses of 1937, but with a gradual improvement of the roadbed and the replacement of temporary structures with permanent structures, a further reduction in maintenance and operating costs may be expected in the near future.

THE PERRY'S VICTORY MEMORIAL COMMISSION

(WEBSTER P. HUNTINGTON, *President*)

This report of the Perry's Victory Memorial Commission, created by act of Congress March 3, 1919, is its seventeenth and final annual report, not including a special report filed April 6, 1933. The act of Congress entitled "An act to provide for the creation of the Perry's Victory and International Peace Memorial Monument, on Put-in-Bay, South Bass Island, in the State of Ohio, and for other purposes", approved June 2, 1936, transferred control and administration of the memorial to the National Park Service under direction of the Secretary of the Interior, effective by proclamation of the President July 6, 1936. By the terms of this act the former Memorial Commission was terminated but its membership reconstituted as a board advisory to the Secretary of the Interior in the future administration of the Perry's Victory and International Peace Memorial.

Previous annual reports have set forth in detail all financial transactions of the former Commission, as required by law to be filed with the Secretary of the Interior on the first Monday of December of each year. The present report is therefore a summary of the sixteenth annual report for the year ended December 1, 1935, and a statement of receipts and expenses for the fiscal year ended June 30, 1936, with additional information as to operation of the memorial during the season of 1936, as compared with recent previous seasons.

Receipts for the memorial for the fiscal year ended June 30, 1936, were \$3,320.80, and expenses the same amount, such expenses, however, including disbursements of \$336.80 on account of previous indebtedness from operation.

Receipts from operation for the year ended December 1, 1935, as shown by the Commission's sixteenth annual report, were \$3,128.80, and expenses \$2,489.25, the cash balance December 1, 1935, being \$699.95. Receipts indicated an increase of approximately 18 percent over the previous year, and expenses a decrease of \$573.45.

Based on the increase in receipts to August 24, 1936, as compared with the same period in 1935, the total increase for 1936 will be not less than 25 percent. This would indicate an increase of approximately 45 percent over the season of 1933, the most unprosperous

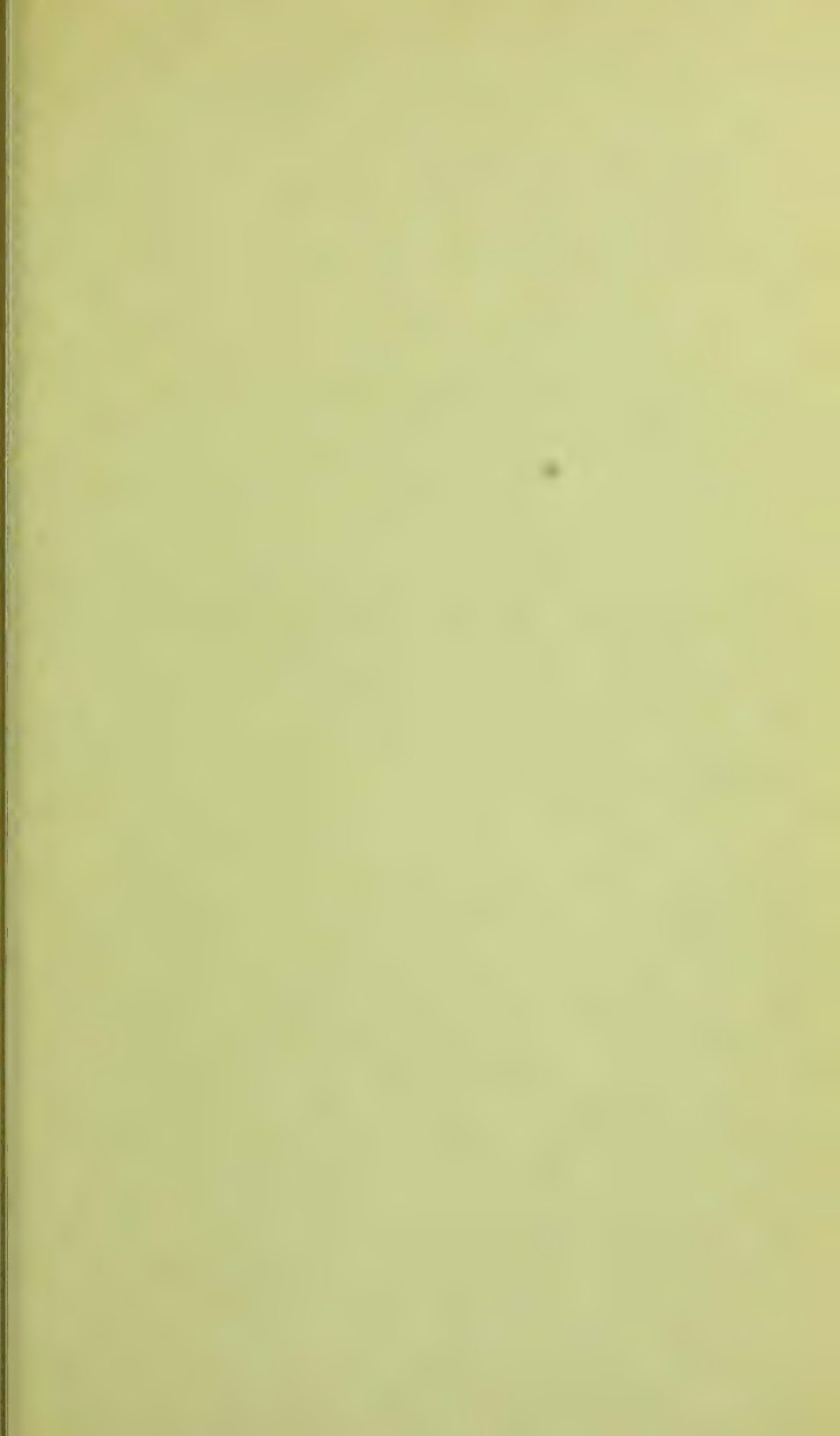
in the history of the memorial since it was opened to the public in 1915.

Concerning funds received by the Commission from the grant, in 1934, of \$25,025 by the Federal Emergency Administration of Public Works, of which \$4,465 was rescinded, there remains an unexpended and unappropriated balance of \$353.11.

In its annual report for the year ended December 1, 1935, the Commission appealed for cooperation of the Department of the Interior to discharge its indebtedness continuing on account of the rescindment of the allotments above referred to and to meet other indebtedness necessarily incurred in operating the memorial during 5 years of general business depression. The total indebtedness thus indicated is \$7,605.50. To emphasize the justice of relief in this amount by the Government, the Commission sets forth the fact that upon transfer of the memorial to control of the Secretary of the Interior and National Park Service by the act of Congress approved June 2, 1936, the Government came into possession of assets totaling \$37,829.56, derived by the Commission, in its 16 years of administration of the memorial, in large part from sources other than its revenues from operation and representing chiefly absolutely necessary improvements. The Commission now respectfully renews its request contained in the report aforesaid, that payment of the debt of \$7,605.50 shall be regarded by the Government as an obligation meriting discharge by act of Congress or otherwise.







1937

Annual Report of the Secretary of the Interior

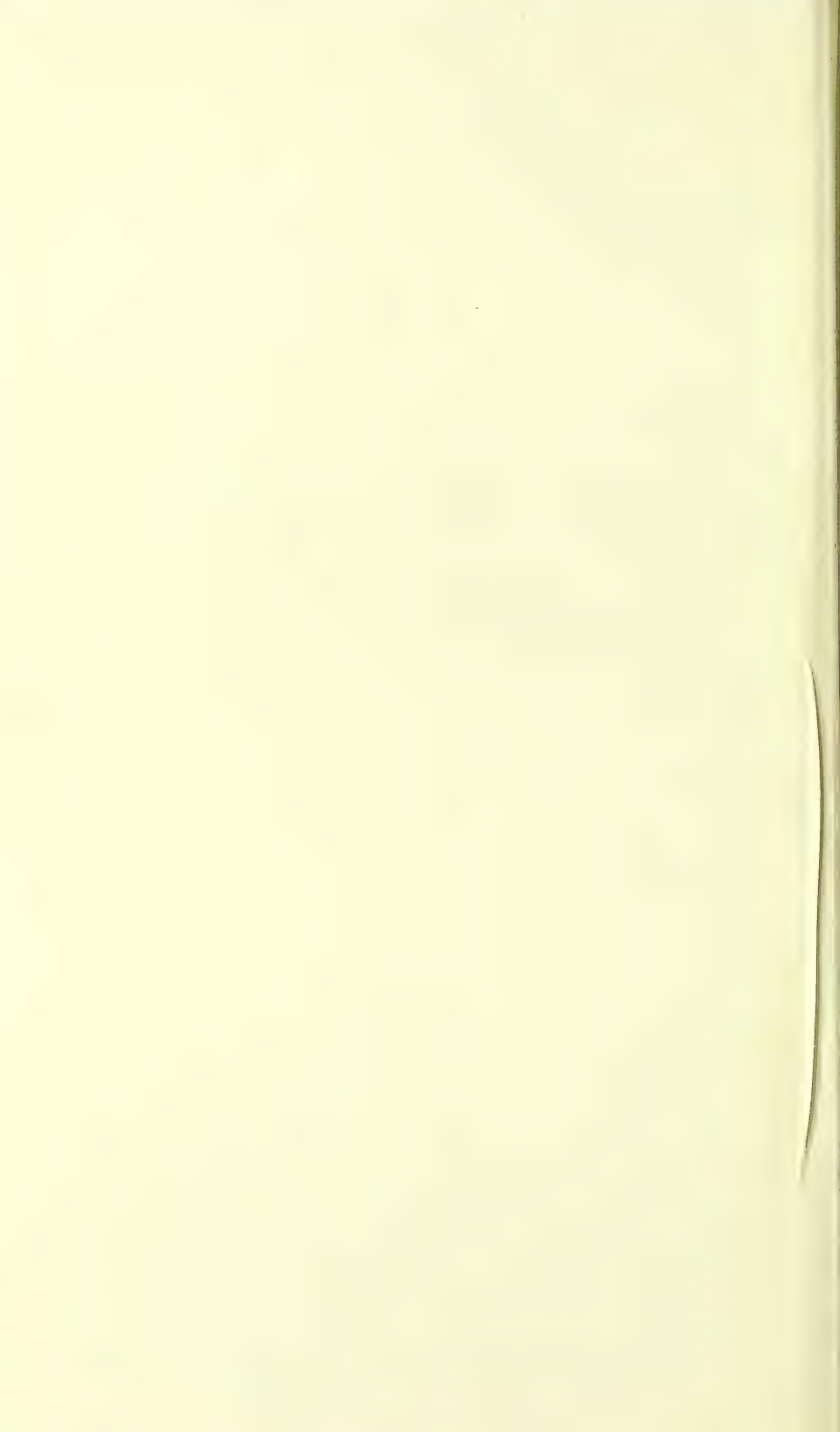


FOR THE FISCAL YEAR ENDING JUNE 30

1937



A NIGHT VIEW OF GRAND COULEE DAM ON THE COLUMBIA RIVER WHERE THE BUREAU OF RECLAMATION IS BUILDING THE WORLD'S MOST MASSIVE STRUCTURE OF ITS KIND.



**ANNUAL REPORT
OF THE
SECRETARY
OF THE INTERIOR**



FOR THE FISCAL YEAR ENDING JUNE 30

1937

**UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON • 1937**

UNITED STATES DEPARTMENT OF THE INTERIOR
Harold L. Ickes, Secretary

■

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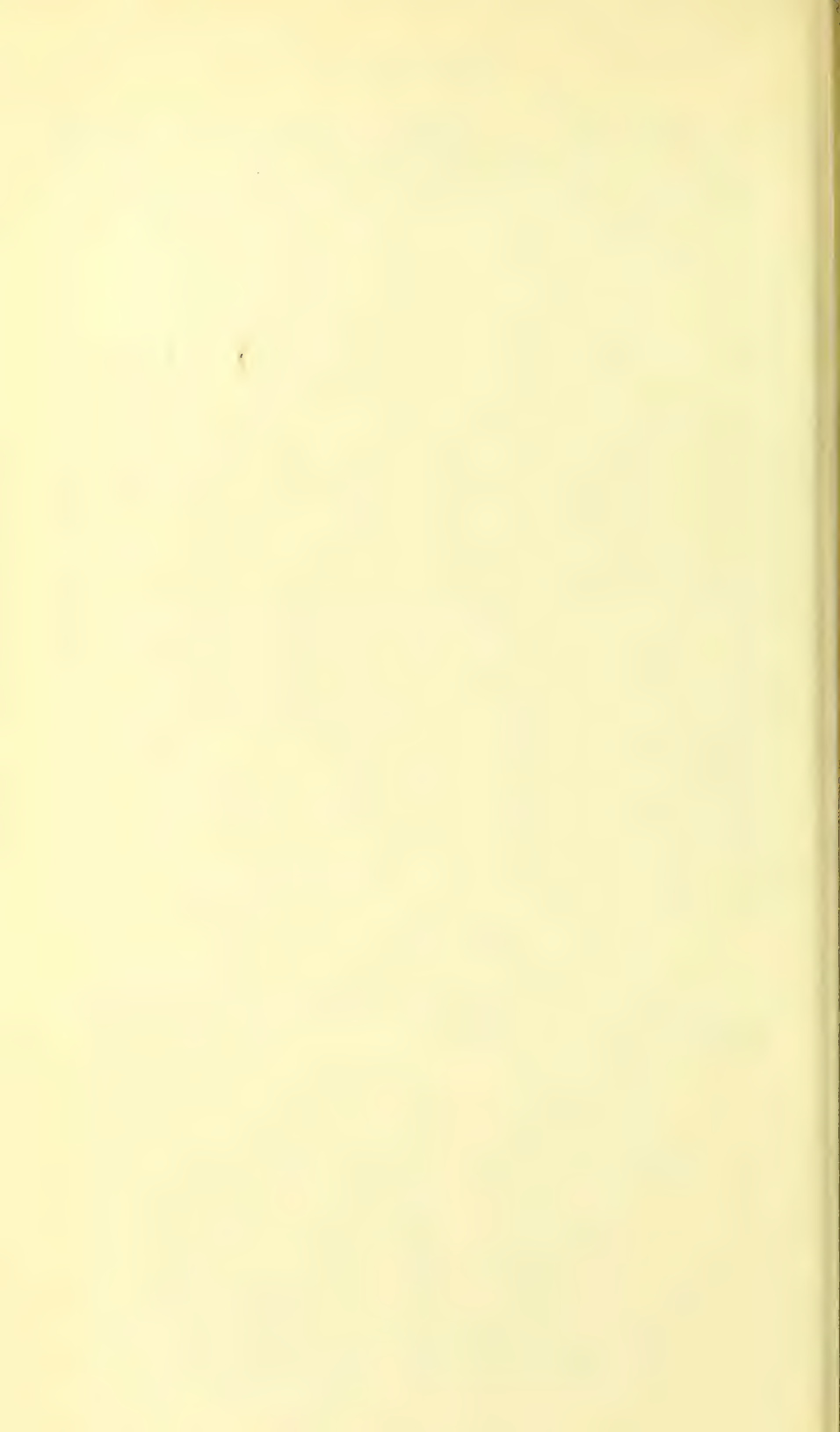
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LETTER OF TRANSMITTAL

THE SECRETARY OF THE INTERIOR,
Washington.

MY DEAR MR. PRESIDENT: The reports of all agencies of the Department of the Interior which are herewith transmitted, demonstrate a new and lively national interest in the conservation of our land, water, and mineral resources which continued to be the principal activity and objective of the Department for the fiscal year ending June 30, 1937. It would appear that our citizens have adopted the concept that prudently conserved national resources can be made to produce a far higher standard of living for the country over a longer period if government is intelligent and energetic in enlisting our resources for such service.

Unprecedented demands made upon the Department are testimony that there exists in the United States today a better understanding of the conservation movement, with a wider appreciation of the long-range purposes of projects undertaken by your administration to protect our national heritage of wealth.

The facilities of the Department have been taxed to satisfy this healthy conception that has come to dominate national thought on certain phases of government. Fifteen million of our people in the past 12 months have availed themselves of the recreational resources administered by the National Park Service. The Bureau of Reclamation, although it is carrying on a program of hitherto unequalled scope, has been unable to meet the requirements of vast numbers of our people who seek the economic stability available through wise use of land and water. Officials of other units of the Department of the Interior report similar situations.

Energetic and faithful endeavors have been made by the members of the staff to follow the conservation tasks which have been assigned to us. A review of the reports of Bureaus and Divisions will demonstrate the progress that has been made since 1933.

SOME OUTSTANDING ACHIEVEMENTS

In a letter of transmittal, I cannot touch upon all of the many achievements, activities, programs, and plans of an organization as far reaching as the Department of the Interior, but I shall summarize a few of them. For instance:

Stabilization of the livestock industry, dependent upon the public range, is in sight. Progress beyond earlier expectations has been made under the Taylor Grazing Act and its amendments which increased the limitation on public grazing lands from 80,000,000 acres to 142,000,000 acres.

The largest program of construction in its history was carried forward during the year by the Bureau of Reclamation, with excellent progress being made in the building of the Grand Coulee Dam, the

principal engineering feature of the Columbia River Basin project. No Federal reclamation project was without water in 1936 and the total value of the crops produced on the 2,901,919 acres of reclamation land in 1936 was \$136,502,480, which was \$29,721,186 more than in 1935 and \$36,713,477 more than in 1934.

The 1936 travel year in the national parks was the best on record with indications that the 1937 travel year will be even better. During the fiscal year increases in the national park and monument system brought the total number of areas from 135 to 140 and the total acreage from 15,496,808.34 to 17,086,671.31.

At the close of the fiscal year, 65 tribes had adopted constitutions and bylaws under the Indian Reorganization Act which were approved by the Secretary of the Interior. There was a marked increase in Indian initiative and management. Indians increased the use of their own lands for grazing, with a resultant growth of their livestock industry. The emergency conservation work was of fundamental importance in the revitalization of Indian life.

The Office of Education pioneered in the fields of conservation education, radio education, and public forums. Conservation is now being taught in a number of the schools and universities.

The market for contraband oil was virtually destroyed and the production of "hot" oil in east Texas was reduced to a fraction of 1 percent.

The Bureau of Mines continued to give valuable technical assistance to the oil industry with a view to prolonging the life of this irreplaceable resource. Other scientific studies were made during the year the results of which will be of great value to the mining industry and American business generally.

The Geological Survey continued its investigations of underground waters, so important in the drought-stricken areas; maintained technical supervision over more than 9,000 properties containing oil and gas, more than 600 containing coal, and more than 100 containing other minerals.

Improved economic conditions were reported from Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

The Puerto Rico Reconstruction Administration, which is now a part of the Department of the Interior with the Secretary as Administrator, is making satisfactory progress in the rehabilitation of Puerto Rico.

LAND AND WATER USES

Primarily the work of the Department of the Interior is concerned with the custodianship of a vast national estate. The administration, protection, and prudent use of this land, our greatest natural resource, is today the chief function of this Department.

"When the topsoil is gone, men must go; and the process does not take long," said Theodore Roosevelt nearly 30 years ago. For the first time since 1908 we have in the seat of Government an administration that is giving actual heed to that warning.

There was a time when, under existing acts of Congress, the chief concern of the Department of the Interior was to dispose of public land and to encourage the exploitation of the vast mineral wealth that was to be found beneath its surface. This was the national policy and for the development of the country it was undoubtedly thought by all to

be a proper policy. But we are living in a new era. The Commissioner of the General Land Office takes cognizance of our new land policy. He points out that the work of the General Land Office has undergone a decided change in recent years. Conservation, rather than disposal, is now the dominant note in the administration of the public lands under existing laws.

While formerly the public lands were open range, subject to unrestricted grazing use, more than 110,000,000 acres of the 142,000,000-acre authorization have been included within grazing districts, and grazing leases have been issued under the supervision of the General Land Office regulating the use for grazing of approximately 5,643,000 acres outside of such grazing districts.

As of June 30, 1934, the date on which a computation was last made, the area of the unappropriated and unreserved public lands was approximately 165,695,479 acres, excluding Alaska, and not including small areas remaining undisposed of in several States. Of such lands 119,341,782 acres have been surveyed and 46,353,697 are unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which only 2,044,421 acres have been surveyed.

THE GRAZING PROGRAM

The Department's grazing regulation program in forwarding which we have the cooperation of the stockmen, moved forward on an enlarged basis. Just before the beginning of the last fiscal year the law was amended increasing the 80,000,000-acre limit of public lands to be included within grazing districts to 142,000,000 acres. The first 2 years of operation under the Taylor Act were largely organizational and educational while the fiscal year ended last June was marked by a decided enlargement of the program.

There was undertaken a definite program of wildlife conservation. Among other accomplishments were the determination of the proper relationship of the private and public lands involved, the study in range carrying capacities and the cooperative agreements with local stockmen and with the Federal and State agencies, having as their objectives the rehabilitation and preservation of the land.

A survey of the range, which was begun in March 1936, includes not only a determination of the carrying capacity and proper seasonal use of the land but also an examination of the private lands and water within these areas. It is believed that by 1940 we will have sufficient data to put all districts on a permit basis.

Range improvement allotments have been apportioned in accordance with the amounts of fees collected in grazing districts. These improvements consist of fencing; posting stock driveways; extermination of rodents, insects, and predatory animals; maintenance of water development, and construction of stock trails.

Parts of the range used partially or not at all in past years were made available for grazing largely through the conservation and equitable distribution of water. Dams were built to impound the water from mountain streams and to store the early run-off and check dams were constructed in dry creeks to arrest soil erosion during the wet seasons. Wherever they could be located, springs were developed, wells were sunk, and troughs and tanks were constructed.

In conjunction with the water program we opened truck trails into grazing regions and built stock trails to facilitate the movement of animals. More than 2,300,000 acres were covered in an extensive campaign against rodents and other pests.

As an important phase of the grazing administration, we instituted a four-part program of wildlife management which consisted of agreements with the stockmen and district advisory boards; range improvements through emergency conservation work; cooperation with the Bureau of Biological Survey of the Department of Agriculture in setting aside game ranges to be used jointly by domestic livestock and game, and State plans for wildlife such as those in New Mexico and Oregon.

There were issued 15,067 temporary licenses for 7,434,416 head of livestock during the year.

Enforcement of grazing regulations has been based on education and understanding. There have been comparatively few complaints. Only 607 applicants (about 4 percent) filed motions for review before regional graziers. In other words, 96 percent of the applicants were satisfied with the action taken by field officers.

Public opinion has crystallized in support of regulation of grazing on the public lands, which not only protects a priceless natural resource but ministers to the wellbeing of 2½ million people depending upon the cattle and sheep industry.

A RECORD IN RECLAMATION

The record in reclamation and irrigation is one of which I am particularly proud. The people of the West know of that record. An increasingly larger number of our citizens in other sections of the country now have a better understanding of the problems of the West and a truer conception of what the Federal Government, through the Bureau of Reclamation, is attempting to accomplish through the erection of dams and irrigation systems for the benefit of all of the people.

Having completed Boulder Dam, the operation of which controls the Colorado River, the Bureau of Reclamation is now engaged in building the Grand Coulee Dam which will make useful for power and irrigation purposes the turbulent waters of the Columbia River. Boulder Dam's first generator went into action on September 11, 1936 when the President pressed a button in Washington.

Grand Coulee Dam, 550 feet in height and containing 11,250,000 cubic yards of concrete, was the outstanding project under construction by the Bureau during the last fiscal year. Eventually it will make possible the irrigation of 1,200,000 acres of arid but fertile lands in the Columbia River Basin. It is estimated that the completed dam and appurtenant works will cost \$119,000,000; the power plant \$67,000,000 and the irrigation system \$208,000,000. Revenues from power and from repayments by irrigation water users are expected to repay the cost of the project. In addition to the production of cheap power and its irrigation features, the Grand Coulee project will serve important functions in controlling floods and improving navigation on the Columbia River.

The construction contract for the foundation was 54 percent completed at the beginning of the fiscal year and 82 percent at the close

of the fiscal year. During the year more than 2,000,000 cubic yards of concrete were placed, a record of 13,002 cubic yards being made on June 24. The estimated cost of the foundation section is \$62,900,000 and it is scheduled to be completed about the middle of the fiscal year 1938. Progress during the year was many months ahead of schedule. An average of 6,000 men was employed at the site of construction during the year. Possibly two and a half times as many more were employed indirectly in the manufacture and transportation of equipment and materials.

Work also has proceeded satisfactorily on the Central Valley project in California, another major undertaking, designed to regulate the flow of both the Sacramento and San Joaquin Rivers. The principal construction features of this project include the Shasta Dam, built of concrete masonry, 450 feet high, storing about 4,500,000 acre-feet of water, and a powerhouse with an initial capacity of 280,000 kilowatts, and an ultimate capacity of 350,000 kilowatts.

The Reclamation Bureau reports that since 1906 the grand total of crop revenues from reclaimed land is \$2,311,783,232, which is approximately 10 times the cost of the Federal irrigation works serving the land. In 1936, the return to the farmer on these projects for each acre was two and one-half times that received by the average farmer the Nation over.

The Bureau carried forward the largest construction program in its history, with new records set in construction of all the types in which it engages. Six major dams were begun, making 18 storage dams and 3 diversion dams under construction. Pine View Dam, Ogden River Project, Utah, was completed and placed in service.

During the fiscal year construction work was in progress on 35 projects in 13 States. The Bureau constructed 249 miles of canals; 134 miles of drains; 14 tunnels of a total length of 49,393 feet; 222 miles of roads; 2.4 miles of railroad; 34.5 miles of transmission lines; 4,739 canal structures; 383 bridges; 851 culverts; 46 miles of pipes and 192 flumes; 2,065,006 cubic yards of concrete went into dams, together with 3,553,870 cubic yards of earth and 536,180 cubic yards of rock fill. Excavations consisted of 43,858,688 cubic yards of earth and rock.

There are tables included in this report which show that the population of farms and towns served by Federal reclamation projects exceeded in 1936 that of any previous year. There were 210,466 persons living on farms and 653,441 persons in towns on the projects. In the same areas were 859 schools and 996 churches. As an indication of a returning prosperity, total bank deposits of \$226,903,747 were reported.

ANTI-LAND-SPECULATION ACT

Before I leave the very excellent record of the Reclamation Service, I wish to direct attention to the act of Congress to curb speculation in the lands adjacent to the Grand Coulee Dam project which was enacted on May 27, 1937. This was one of the most important pieces of legislation bearing on Federal Reclamation during the past year. By this measure there was written into the law dealing with the Columbia Basin development provisions which had been covered by departmental regulations on other projects since 1926. The purpose of the act is to assure settlers and home seekers of the opportunity to

acquire land at its value before the expenditure of Federal funds on the project. The act requires ratification by the State of Washington and the negotiation of repayment contracts before construction can proceed beyond the completion of the Grand Coulee Dam.

The operations of the Bureau of Reclamation over a period of 35 years have resulted in the construction of 138 storage and diversion dams; 24 powerhouses; 2,344 buildings; 19,116 miles of canals, ditches and drains; 72½ miles of tunnels; 4,367 miles of telephone lines; 267 miles of dikes and levees; 6,041 flumes; 18,694 culverts; 13,166 bridges; and 182,964 other irrigation structures.

PARK AREAS INCREASE, TRAVEL RECORD MADE

Another agency of the Department of the Interior that deals with the preservation of our natural resources is the National Park Service.

At the end of the fiscal year there were 26 national parks, 2 national historical parks, 72 national monuments, 11 national military parks, 8 national battlefield sites, 8 national miscellaneous sites, 11 national cemeteries, and 1 national parkway under the jurisdiction of the Department of the Interior. By Executive order there were transferred to the Park Service 46 recreational demonstration areas from the Resettlement Administration.

The national park system embraced 17,086,671.31 acres, a gain in one year of 1,594,733.43 acres.

One of the outstanding achievements in national legislation affecting the parks was the enactment of the bill which saved thousands of acres of the dwindling supply of the rare, giant sugar pine trees bordering the western boundary of Yosemite National Park.

The Department is availing itself to the fullest possible extent of the powers granted under the legislation which, to our way of thinking, represents true conservation both theoretical and applied. We are delighted at the opportunity to serve in assisting the Congress and the President in assuring the preservation of these trees from the destruction which threatened them.

The authorization for acquisition covering 7,200 acres includes 6,700 acres which were owned by a private lumber company which was preparing to turn the two- and three-century-old trees into lumber leaving only the desolate, sheared-off stumps as a memorial to despoiled nature. There is no opportunity anywhere else in the world to preserve as magnificent an example of virgin sugar-pine forest as exists in this one place.

Amicable relations with Mexico were strengthened through the cooperation of the National Park Service in connection with studies and investigations with respect to the proposed Big Bend National Park in Texas. Tentative boundaries of the proposed park were agreed upon at joint sessions of the commissions representing the United States and the Government of Mexico. The plan is to establish an international park linked by a bridge across the Rio Grande River at Boquillas.

Under the Service's recreational demonstration program 47 organized camp grounds were under construction in 24 areas, of which 15 were completed in time to be put into use during the 1937 summer season.

There was begun a Nation-wide study of park, parkway, and recreational area programs in the United States with a view to setting up a comprehensive plan to serve as a guide to the States and as a basis upon which future cooperation will be extended. Increased consideration was given to the regional method in developing and administering park areas.

More than 4½ millions of persons were contacted during the fiscal year as a result of the educational program of the Park Service which consists of campfire circles, hikes, attendance at park museums, and lectures by ranger-naturalists and historians.

Progress was reported in archeological and historical conservation. The number of historical and archeological sites authorized or established under the National Park Service was increased to 100.

Travel in the national parks reached a new high level during the 1936 travel year which ended on September 30 and an all-time high of nearly 15,000,000 visitors was attained during the past travel year.

The United States Tourist Bureau, a national clearing house of information on recreational and travel opportunities in the United States, territories and insular possessions, was established by the National Park Service in New York City. This bureau cooperates with the States, Territories, and insular possessions, and transportation and travel agencies in assembling and disseminating tourist information. One of its purposes is to promote abroad an interest in travel to and within the United States.

INDIANS ADVANCE CONSERVATION

No discussion of conservation would be complete without adequate recognition of the splendid work done by the Indian Service and of the accomplishments of the Indians themselves.

In his annual report to me the Commissioner of Indian Affairs says that the conservation program has been put ahead at least 20 years by the Indian Service's program of activities in soil erosion control, water development, etc.

Under the Indian Reorganization Act, there has been a marked improvement in the economic status of the Indians. They have increased the use of their own lands for grazing with a consequent growth of their livestock industry. Livestock cooperatives increased from 55 in 1935 to 119 in 1936.

Indian education also is on the upgrade. There was noted an increase in Indian day-school enrollment from 4,532 in 1928 to almost 12,000 in 1937. During the same time the number of Indian pupils in public schools grew from 34,163 to 50,328. There were 37 new day schools during the last 2 years. There also was a greater interest in secondary education, with a substantial attendance increase, taxing capacity, expected next year.

The problem of the Indian continues to be that of land. In 1887 when the General Allotment Act was passed 130,000,000 acres of land were held in trust for Indians. In 1933, when the present administration came into power, only 49,000,000 acres of the poorest land remained. At the close of the last fiscal year there was a total of 52,650,000 acres of Indian lands with additional purchases pending.

Sixty-five tribes, with a population of 86,238 as of last June 30 had adopted constitutions and bylaws under the Reorganization Act which

were approved by the Secretary of the Interior. Since this report was compiled, 71 tribes have adopted constitutions.

PETROLEUM CONSERVATION

The Connally Act, which prohibits the shipment in interstate and foreign commerce of petroleum and its products that are produced in violation of State law, was extended on June 14, 1937, to June 30, 1939.

It has been necessary to establish but one tender board, that in the East Texas field. Should the need arise, additional boards may be established by the President. The law is effective, however, in other fields although the tender system is not employed. The need for a tender board in the east Texas field is evident when the magnitude of the area is understood. This field contains more than 130,000 acres of productive territory in which 23,000 oil wells were producing in June 1937. This field produces about 15 percent of the national crude oil output. When it was discovered in 1930, it contained at least one-quarter of the oil reserves of the entire United States.

During the fiscal year the reported production of crude oil in east Texas was 160,717,784 barrels of which 92 percent were shipped on Federal tenders. Although only 8 percent of the crude oil is refined in the field, the petroleum products, including casing-head gasoline and butane, moving on Federal tenders totaled 23,233,000 barrels during the year.

The Government and the State of Texas have worked together in east Texas in the prevention of waste, with the result that the ultimate productive capacity of the field has been greatly extended. It has been estimated that the recoverable oil from this field has been increased by 30 percent or 600 million barrels, which would be equal to the discovery of 60 average-sized oil fields, through Federal and State Government cooperation. The market for contraband oil has been virtually destroyed and the production of "hot" oil in east Texas has been reduced to the vanishing point.

BUREAU OF MINES

The Bureau of Mines has given valuable technical assistance to the oil industry that is designed to prolong the producing life of wells through the application of better engineering practices and by estimating the probable life of wells by working out the relationship between the rate of fluid production and the pressure drop in the producing formation. The Bureau also has given advice in order to avoid waste in transportation and storage.

The petroleum industry as well as State regulatory bodies realizes that the difficult problem of oil- and gas-well spacing is one of major importance. Knowledge as to how wells should be spaced in order to assure maximum recovery through prolonged flowing is far from perfect. A study of present-day conditions that would show the fallacies of ruthless offset drilling would aid greatly in conserving the country's oil reserves.

The Bureau has continued to issue monthly forecasts of demand for petroleum products, thus assisting State commissions in their efforts to control production.

No one knows when it will come, but most experts foresee a day when our petroleum reserves will begin to fall and prices begin to rise. In anticipation of this, the Bureau of Mines has been operating a continuous hydrogenation plant at its Pittsburgh station to test the adaptability of various domestic coals to the process. The Bureau reports that Great Britain, Germany, France, and Japan are preparing to supplement their inadequate petroleum stocks with gasoline obtained by the hydrogenation of lignite, tar and bituminous coal.

The Bureau of Mines has continued its research for methods for making America self-sufficient in strategic minerals, particularly those of importance in warfare. Development of an electrolytic process for recovering pure metallic manganese gives hope that this country may be able to produce all that may be required of that important metal. The treatment of pegmatite tin ores is another metallurgical enterprise which, if successful, may make it possible for the United States to produce at least a part of its tin supplies now obtained from abroad.

Of late the scrap metal industry has attracted considerable attention. At one time exports attained proportions that many considered alarming. Because of the interest in this industry the Bureau, in addition to the seven nonferrous metals ordinarily included in the annual surveys of secondary material, made consumption studies of iron and steel scrap. The canvass of the use of primary and secondary tin was resumed at the request of tin consumers.

The Bureau has developed a cheap method of concentrating low-grade spodumene ore, one of the principal sources of lithium salts, that promises to help the establishment of a paying industry in the South. Spodumene occurs in large quantities in North Carolina.

Smelting companies and city governments showed a keen interest in a device for precipitating solids from air or other gases, which was developed by the Bureau on a laboratory scale and which was demonstrated successfully on a number of occasions.

The Department was called upon for technical advice following the destruction of the airship *Hindenburg* and the gas explosion at the New London, Tex., school. Experts on explosions, helium, natural gas, and safety collaborated in studies to determine the cause of the school explosion. Since that catastrophe, other communities have asked the Bureau of Mines to make similar studies of schoolhouses and other public buildings.

The Director of the Bureau of Mines points out that the number of nonmetallic minerals is so great and the variety of things that might be done with them by using cheap electric power is so numerous, that a study of the problem is urgently needed.

The Director also recommends that two additional wells be drilled in the Government-owned helium-bearing structure at Cliffside, Tex., and that one of the existing wells, which is in faulty mechanical condition, be repaired. This is necessary to meet an anticipated increase in the demand for helium for commercial and medical use.

Since the end of the fiscal year, the act authorizing the conservation, production, and exploitation of helium gas, a mineral resource pertaining to the national defense, and to the development of commercial aeronautics, was amended in many important respects by the act of September 1, 1937.

The Secretary of the Interior will render to Congress on or before the first day of January of each year a report showing the status of the helium production fund. The National Munitions Control Board shall include in its annual report to the Congress full information concerning licenses issued, together with such information and data collected by the Board as may be considered of value in the determination of questions related to the exportation of helium gas.

MINE SAFETY WORK

During the years immediately preceding the creation of the Bureau of Mines there were on an average each year 17 mine disasters resulting in 562 fatalities. During the past fiscal year there were only 6 major catastrophies from which 56 deaths resulted. Training courses conducted by the Bureau teach men how to treat injuries and what to do in emergencies. Inspections, recommendations for improvement of practices at mines, first-aid meetings, and other means of promoting education and safety among the 2,000,000 employees of the mine industry have contributed to the conservation of natural resources, to the preservation of life, and to the prevention of suffering.

FINDINGS AND STUDIES OF THE GEOLOGICAL SURVEY

The Geological Survey during the year made more than 9,000 findings of technical facts regarding the mineral resources, water power, or storage possibilities of public lands. Surveys of underground waters were continued. Much of this work was done in co-operation with the States and 75 reports on this subject were released for public use. Drought and flood studies were continued and the measurement of stream flow was maintained at 3,379 stream-gaging stations.

The Survey made more than 4,500 tests of mineral and rock samples and in excess of 2,200 chemical analyses were completed. More than 14,500 square miles of new areas were surveyed topographically, which will result in 102 contour topographic maps in 36 States and in Puerto Rico. In addition, by the aid of aerial photography, 4,780 square miles were surveyed in five States for the production of planimetric maps without contours.

Fifty-seven books of the Survey's regular series, dealing with geology, mineral resources, and water supplies, were issued during the year and about 673,000 copies of 296 topographical and other maps were printed. A geologic map of Texas was completed. The United States is now 47.4 percent mapped, the fiscal year's increment amounting to 0.3 percent.

Fifty-nine geologic parties were in the field in 33 States during the year. Work was begun on several new projects, including studies of areas in Idaho, Arizona, the Big Horn Basin in Wyoming, and the Ohio River flood.

The Conservation Branch added 100,699 acres to the outstanding water power reserves, making a total net reserve of 6,583,439 acres.

Two deposits of activable bleaching clay are now in commercial production, largely as a result of studies and tests in the laboratories of the Geological Survey. This investigation, according to the Survey's report, led to a rationalization of the operation and other

deposits found may eventually result in a more economical use of the raw materials available.

The Chief of the Conservation Branch reports a loss of revenue because of insufficient appropriations to provide adequate supervision of operations under the mineral leasing activities on the public domain. It was pointed out that there were 85 operating properties under leases on the public domain upon which production increased between 5 and 10 percent during the year, resulting in increased revenue to an aggregate total of \$6,300,000.

The Conservation Branch complains that, as in other years, as the result of inadequate appropriations, revenue far in excess of the appropriation asked for has been lost because of inability to make timely inspections of field properties and to assure that operations were conducted so as to accomplish the greatest ultimate production and effective current beneficial use of the mineral resources involved.

MORE SCHOOLS TEACH CONSERVATION

The Office of Education organized a service in conservation during the year in addition to its activities in public forums and radio education. There has been considerable demand for consultative service and for teaching materials on the subject of conservation and the Commissioner of Education reports that conservation education is gaining ground rapidly.

Conservation is being included with increasing frequency in the curricula of elementary and secondary schools, especially in connection with courses in science and social studies. Also, in the universities, the study of natural resources is more and more pointed toward conservation. A conference of leaders in the conservation field was held in Washington last June.

The increase in secondary school enrollments for the first time brought high-school graduates to more than a million for the fiscal year.

Among the significant trends noted in rural education was the abandonment of a large number of one-teacher schools in favor of larger centralized schools. The number of one-teacher schools has been reduced by 10,169 in 4 years. During the same period the number of rural schools offering high-school work was increased by 883, or 5.3 percent, but the number of children attending high schools in rural communities was increased 764,513 pupils, or 53.2 percent. The increase in the number of consolidated schools was due to the construction program of the Public Works Administration.

The salary scale of rural teachers was less encouraging. During the 4-year period rural teachers' salaries were cut approximately 20 percent while those of city teachers were cut about 10 percent.

The Office of Education reports a steady improvement in conditions in higher education. Full-time enrollments were up 6.5 percent and total enrollments increased 7.5 percent. Salaries in most colleges and universities were restored to normal levels.

Five national educational projects, begun with emergency funds, were continued, as follows: (1) Study of local school administrative units; (2) surveys of vocational education and guidance of Negroes; (3) educational radio project; (4) cooperative university research project; and (5) public-affairs forum project.

More than 400,000 listeners responded by letters to the Office of Education, showing their interest in the series of educational broadcasts during the year.

BRIGHT OUTLOOK FOR TERRITORIES AND ISLANDS

Economic conditions in the territories and island possessions showed marked improvement. With the aid of Federal emergency funds, construction programs not only aided employment but created necessary and useful public facilities in Alaska, Hawaii, Puerto Rico, and the Virgin Islands.

An important development in Puerto Rico was the purchase by the Government of the Ponce Electric Co. at a total cost of \$1,082,431.41. This will permit the distribution of additional power at a fair price.

In the Virgin Islands the improvement and extension of the Blue Beard Castle Hotel, a continuation of the homestead program, and the construction of roads were among the major developments of the year.

The Alaska Legislature appropriated \$400,000 for roads and airfields, passed acts creating a Territorial planning council and aeronautics and communications commission. Social security legislation and new tax schedules for mines and mining were adopted.

The Alaska Railroad deficit, \$172,065, included expenditures of \$174,588 for the operation of vessels from Seattle to Alaskan ports during the maritime strike and \$7,449 for investigations of the mineral resources of the Territory. Based on normal operations expenses, the road would have shown a profit of \$9,971.

Alaska's budget was in balance for the biennium of 1937-39. The deficit in the general fund beginning the 1933-35 biennium was \$1,527,944.49. At the close of 1937 there was a surplus of \$1,315,133.51.

The commerce of Hawaii showed a substantial increase, the total value of exports and imports, \$219,639,784, was an increase of more than \$35,000,000 over 1935.

The population of Hawaii during the fiscal year increased 3,458, making the total population 396,715, of whom 310,956 are American citizens.

A "LITTLE NEW DEAL" FOR PUERTO RICO

As a result of the widespread and varied activities of the Puerto Rico Reconstruction Administration, this island possession is making rapid economic recovery. The reconstruction program is checking certain economic tendencies among which are the concentration of land in fewer hands, the concentration of population in urban areas, absentee ownership of important property, one-crop farming, and poor health conditions.

To meet these problems the Puerto Rico Reconstruction Administration is pushing forward a comprehensive recovery program including rural rehabilitation; land purchase and resettlement; crop diversification; reforestation and soil erosion control; development of hydroelectric power; rural electrification and irrigation; extension of agricultural and vocational education; expansion of the university; and establishment of health centers and housing, including low-cost and slum-clearance projects.

The Puerto Rico Reconstruction Administration has been reorganized since the close of the last fiscal year. The President, by executive order, placed it within the Department of the Interior and designated the Secretary of the Interior as Administrator.

COOPERATION OF CIVILIAN CONSERVATION CORPS

I wish to record my appreciation of the splendid work that has been done by the Civilian Conservation Corps. With the cooperation of this fine organization the Department's conservation program has been put forward many years.

During the fiscal year, the National Park Service supervised the work programs of 91 C. C. C. camps in national parks and monuments and 353 camps in Federal, State, county, and municipal areas. The Park Service also was responsible for camp management and work supervision over 800 enrollees in Hawaii and 400 in the Virgin Islands.

There were 45 C. C. C. camps assigned to the Division of Grazing during the fiscal year. The work projects of these camps in nine States were recommended by the advisory boards of the grazing districts in which the camps were located.

There was an average of 34 C. C. C. camps in operation on reclamation projects engaged in the reconstruction of distribution systems, rodent control work, weed eradication, and forest-fire- and flood-control work.

There were also 6,387 Indian enrollees engaged in conservation work on 69 Indian reservations.

The Civilian Conservation Corps educational program of the Office of Education was considered an essential part of the entire Civilian Conservation Corps program. During the year this program was extended to include 90 percent of all of the enrollees and there were improvements in the educational activities and the instruction offered.

NEW INTERIOR DEPARTMENT BUILDING

The Bureaus and Divisions of the Department began to move into the new Interior Department Building last January and the flag of the United States was flown from its masthead for the first time on January 20, 1937. The new office facilities have greatly increased the morale and efficiency of the staff and employees.

A DEPARTMENT OF CONSERVATION

I again renew my recommendation that the name of the Department be changed to that of the Department of Conservation.

Under the present administrative set-up the public domain, in general, is administered by the Department of the Interior which, for many years, has been preeminent in conservation. If that policy is to be followed seriously, as self-preservation demands, this Department furnishes the natural agency within which to concentrate conservation activities.

The President's Committee on the Reorganization of the Executive Departments has stated that conservation represents a major purpose of our Government. It also recommended the creation of a Department of Conservation to replace the Department of the Interior.

Legislation to carry this recommendation into effect is pending before the Congress.

The personnel of the Department, trained in conservation work and guided by the conservation ideals which have been so clearly set forth by the President, joins me in urging the early enactment of this important legislation—important to a proper reorganization of the Government and economically important to the people of the United States.

Very respectfully,

HAROLD L. ICKES,
Secretary of the Interior

THE PRESIDENT,
The White House.

BUREAU OF RECLAMATION

John C. Page, *Commissioner*

SEVERE drought over the Great Plains area and part of the West during the summer of 1936 again made the Federal reclamation projects oases within vast fields of desolation, serving anew to emphasize the value of well planned water conservation undertakings in the arid and semiarid regions.

Areas protected by adequate water storage reservoirs and canal systems suffered little. In many counties dependent upon dry farming 95 percent of the taxes were in default. Adjacent counties which included irrigated lands had tax delinquencies amounting to 5 percent or less of the total. This striking illustration of the manner in which Federal reclamation developments serve to strengthen and stabilize local governments demonstrates also one of their major services to the Nation.

No Federal reclamation project was without water in 1936, and none suffered major crop losses. It was a year of prosperity in all of these areas.

DEMAND FOR NEW LANDS

The heavy demand for new irrigable lands was sustained throughout the year. More than 100,000 farm families have been dislodged by drought from their homes in the Great Plains alone. The greater number of these families have moved on west, looking for new opportunities on irrigated lands where stored water and canals will protect them in the future from the disaster which had befallen them.

In addition to these, many others sought new lands. Some of these were recruited from those with farm backgrounds who were participating in the "back to the land" movement. They were leaving cities in search of more promising opportunities. Others were among those who had exhausted their resources on poor lands in various sections of the country. Still another group of home seekers was made up of young men and women who have come to maturity in homes founded on the irrigated lands of the West.

In the semiarid and arid West where irrigation is essential to safe agriculture, all of these hopeful homeless people look toward the irrigated districts to provide them with the opportunities they seek. Except for the new lands for which the Bureau of Reclamation was prepared to supply water for the first time, there were few farm sites available. During this year the Bureau had only a few thousand acres ready. These were rapidly settled.

It is estimated that the young men and women from other irrigated areas of the West who are now looking for places to make homes for themselves are more numerous than the offerings of new farm units which the Bureau of Reclamation can make for several years.

This situation recommends as a wise policy the early completion of several projects and divisions of projects which are now in construction and which will provide water for the irrigation of new lands.

Throughout the year construction went forward as rapidly as possible with the funds available on 10 projects which will increase the productive area as follows:

The Gila project in Arizona, which will make available on completion 150,000 acres of new land, nearly all of which is public land.

The All-American Canal in California, including the Coachella Branch, when completed will provide water for 525,307 acres, mostly public lands.

The Payette division of the Boise project in Idaho, 51,442 acres.

The Greenfields division of the Sun River project in Montana, 20,000 acres.

The Tule Lake division of the Klamath project on the Oregon-California border, 12,809 acres.

The Owyhee project in Oregon, which is partially complete, but where the irrigation facilities for 47,800 acres remained to be constructed.

The Roza division of the Yakima project in Washington, 72,000 acres.

The Kendrick project in Wyoming, which will serve 39,793 acres.

The Heart Mountain division of the Shoshone project in Wyoming, 41,000 acres.

PROSPECTS GOOD FOR 1937

At the end of the fiscal year, going into the 1937 irrigation season, drought conditions still prevailed in parts of the West. Generally, however, storage reservoirs were well-filled and the lands of Federal projects amply protected. Prospects were bright for a good year on the projects.

Lake Mead, the reservoir created by Boulder Dam, continued to fill. At the close of the fiscal year, it contained 15,000,000 acre-feet and was filled nearly to half of its capacity. Sufficient water was on

hand and in reserve to serve the irrigators of the Yuma Federal reclamation project and the Imperial Valley and other downstream irrigation projects for 3 years.

CONSTRUCTION PROGRAM

The largest program of construction in its history was carried forward during the year by the Bureau of Reclamation, with new records set in construction of all types in which the Bureau engages.

During the year 6 major dams were begun, bringing to 18 the number of storage dams and to 3 the number of diversion dams now under construction. In addition, the Pine View Dam on the Ogden River project in Utah, was completed and placed in service.

This brought to a grand total of 138 the number of storage and diversion dams which have been begun and completed by the Bureau of Reclamation since its origin in 1902. Of these, Shoshone, Arrowrock, Owyhee, and Boulder Dams each were, at the time of their completion, the highest in the world, and Boulder Dam with a height of 726.4 feet holds the record at this time.

The Bureau's construction program has been accelerated by emergency fund allotments and by appropriations. Since 1933, in 4 fiscal years, a total of \$226,786,000 has been made available for construction by the Bureau of Reclamation. Of this amount, \$96,254,000 was allotted from Public Works Administration funds; \$61,922,000 was allotted from emergency relief funds of 1935, and \$68,610,000 has been appropriated directly by the Congress.

The following table shows the source of funds and the amounts made available for the individual projects during this time:

Appropriations and Allotments for Construction and Investigations, 1934-37

State and project	Public Works allotment	Emergency Relief allotment	Appropriation, 1937	Total
Arizona:				
Gila.....	68,000	1,800,000	1,250,000	3,118,000
Colorado River-Indian.....	25,000			25,000
Salt River.....	200,000	3,500,000	1,500,000	5,200,000
Yuma.....	80,000			80,000
Verde—Investigations.....	127,500			127,500
California:				
All-American Canal.....	9,000,000	10,000,000	16,500,000	25,500,000
Central Valley.....		4,500,000	6,900,000	11,400,000
Klamath-Tule Lake.....	25,000	135,000		160,000
Colorado:				
Blue River-South Platte.....	175,000			175,000
Western slope surveys.....	150,000			150,000
Denver office quarters.....	20,000			20,000
Colorado-Big Thompson.....	150,000			150,000
Pine River.....			1,000,000	1,000,000
San Luis Valley.....	2,000			2,000
Uncompahgre.....	2,725,000			2,725,000
Grand Valley.....			200,000	200,000
Eastern slope surveys.....	100,000			100,000
Idaho:				
Boise-Drainage.....	9,000		160,000	169,000
Boise-Arrowrock.....		600,000		600,000
Boise-Payette.....		700,000	1,000,000	1,700,000
Minidoka-Gooding.....	26,000			26,000
Upper Snake River.....	2,250,000			2,250,000

¹ General Treasury.

Appropriations and Allotments for Construction and Investigations, 1934-37—Continued

State and project	Public Works allotment	Emergency Relief allotment	Appropriation, 1937	Total
Montana:				
Bitter Root.....	100,000	200,000	-----	300,000
Buffalo Rapids.....	22,500	-----	-----	22,500
Frenchtown.....	200,000	60,000	-----	260,000
Chain Lakes Storage.....	1,750,000	-----	-----	1,750,000
Milk River.....	75,000	-----	-----	75,000
Sun River.....	950,000	215,000	-----	1,165,000
Nebraska: North Platte Valley.....	25,000	-----	-----	25,000
Nevada:				
Humboldt.....	1,200,000	-----	-----	1,200,000
Truckee River storage.....	1,000,000	-----	-----	1,000,000
New Mexico:				
Rio Grande.....	200,000	-----	-----	200,000
Carlsbad.....	-----	1,000,000	900,000	1,900,000
Caballo Dam—Interior.....	625,000	-----	-----	625,000
Transfer from State.....	1,500,000	-----	-----	1,500,000
Conchas Dam surveys.....	30,000	-----	-----	30,000
New Mexico, Texas, and Colorado:				
Water resources, Rio Grande Basin—Interior.....	80,000	-----	-----	80,000
Transfer from national resources.....	60,000	-----	-----	60,000
Oklahoma: Altus project surveys.....	30,000	-----	-----	30,000
Oregon:				
Burnt River.....	-----	600,000	-----	600,000
Deschutes.....	56,000	-----	450,000	506,000
Grande Ronde.....	10,000	-----	-----	10,000
Klamath-Drainage.....	36,000	-----	-----	36,000
Owyhee.....	5,200,000	100,000	200,000	5,500,000
Stanfield.....	100,000	-----	-----	100,000
Umatilla River Surveys.....	8,000	-----	-----	8,000
Vale.....	1,000,000	340,000	-----	1,340,000
Birch Creek Canal.....	25,000	-----	-----	25,000
Texas: Colorado River.....	-----	5,000,000	-----	5,000,000
Utah:				
Hyrum.....	930,000	-----	-----	930,000
Moon Lake.....	1,100,000	140,000	-----	1,240,000
Ogden River.....	3,490,000	500,000	-----	3,990,000
Provo River.....	800,000	-----	500,000	1,300,000
Sanpete.....	375,000	-----	-----	375,000
Washington:				
Columbia Basin surveys.....	-----	250,000	-----	250,000
Grand Coulee Dam.....	15,000,000	19,800,000	¹ 20,750,000	55,550,000
Yakima-Kittitas.....	39,000	-----	-----	39,000
Yakima-Roza.....	-----	2,500,000	1,000,000	3,500,000
Yakima-Storage.....	-----	180,000	-----	180,000
Wyoming:				
Casper-Alcova.....	6,980,000	5,227,000	1,000,000	13,207,000
Riverton.....	-----	1,000,000	250,000	1,250,000
Shoshone-Willwood.....	50,000	-----	-----	50,000
Shoshone-Heart Mountain.....	-----	1,300,000	700,000	2,000,000
Colorado River Basin States:				
Boulder Canyon.....	38,000,000	-----	¹ 23,600,000	61,600,000
Surveys sec. 15.....	-----	250,000	-----	250,000
Industrial surveys.....	25,000	-----	-----	25,000
Hawaii:				
Water supply survey.....	50,000	-----	-----	50,000
Secondary project investigations.....	-----	250,000	-----	250,000
Administrative expenses.....	-----	1,775,000	750,000	2,525,000
Total.....	96,254,000	61,922,000	68,610,000	226,786,000

¹ General Treasury.

During 1937 construction work was in progress on 35 projects in 13 States. The new dams begun were Bartlett Dam on the Salt River project, Fresno Dam on the Milk River project, Grassy Lake and Crosscut Dams on the Upper Snake River project, Boca Dam on the Truckee River storage project, and Marshall Ford Dam on the Colorado River of Texas project. Two dams—the Midview Dam on the Moon Lake project and the Anita Dam on the Huntley project were being built by C. C. C. forces.

During the year the Bureau constructed 249 miles of canals, 134 miles of drains, 14 tunnels with a total length of 49,393 feet, 222 miles of roads, 2.4 miles of railroad, 34.5 miles of transmission lines, 4,739 canal structures, 383 bridges, 851 culverts, 46 miles of pipe, and 192 flumes. It placed in dams 2,065,006 cubic yards of concrete, 3,553,870 cubic yards of earth, and 536,180 cubic yards of rock fill, and it excavated 43,858,688 cubic yards of earth and rock.

GRAND COULEE DAM—COLUMBIA BASIN PROJECT

The outstanding project under construction by the Bureau was the Grand Coulee Dam, principal engineering feature of the Columbia Basin project. This dam on completion will be the most massive masonry structure in the world. It will be 550 feet high and will contain 11,250,000 cubic yards of concrete.

The dam will have twin power houses on either side of the river with a total of 18 generating units capable of producing at capacity 2,520,000 horsepower.

The project contemplates eventual irrigation of 1,200,000 acres of arid but fertile lands in the Columbia Basin area. In addition to Grand Coulee Dam, other features will be necessary to irrigate these lands, including a pumping plant with a normal capacity of 16,000 cubic feet of water per second, and a balancing reservoir in the Grand Coulee, itself, with a capacity of 1,050,000 acre-feet of water. This reservoir will be formed by earthen dams at each end of the Coulee. An elaborate canal system to carry the water from the reservoir to the lands also is planned. It is estimated that the dam and appurtenant works will cost \$119,000,000, the power plant \$67,000,000, and the irrigation system \$208,000,000. Revenues from power and from repayments by irrigation-water users are expected to repay the cost of the project.

In addition to the irrigation of a rich area, and the generation of a huge block of power which will be available cheaply to the public, Grand Coulee Dam will serve important functions in controlling the floods and improving navigation of the Columbia River, the Nation's second largest stream.

Grand Coulee Dam is the key structure in the long-range plan for development of the Columbia River, the uppermost and largest of 10 dams proposed in series on the stream. It will materially increase the output of firm power at all downstream sites on the Columbia River.

During the year, work on the project included continuation of construction of the foundation of Grand Coulee Dam and investigations and surveys of the Columbia Basin lands.

The construction contract for the foundation stage of the dam was awarded to the Mason-Walsh-Atkinson-Kier Co., July 16, 1934, on

their bid of \$29,339,300. This contract was 54 percent completed at the beginning and 82 percent completed at the close of the fiscal year. During the year more than 2,000,000 cubic yards of concrete were placed with a record daily pour of 13,002 cubic yards on June 24. Excavation for the year totaled 2,500,000 cubic yards, and the total excavation for the structure was 16,809,204 cubic yards.

The parallel cofferdams by which the contractor confined the river to a narrow channel through the central section of the dam, thus permitting work on either side, were completed before the 1936 flood season. A second major diversion was achieved before the 1937 flood season, when two cross-river cofferdams forced the river to flow through slots left in the west section of the dam, thus unwatering the central section. These cofferdams withstood a maximum flow on June 25, 1937, of 273,500 cubic feet of water per second.

An interesting construction feature of the year was the freezing of an arch across the toe of a slide in the east forebay area to restrain 200,000 cubic yards of slipping clay long enough to complete the excavation and place concrete in the dam to a height sufficient to be out of danger. This arch, resting on a timber crib foundation, was 100 feet long, 20 feet thick, and 40 feet high, and contained about 3,000 cubic yards of frozen earth. It was constructed at a cost of \$30,000, and, through halting the slide, prevented an increase in the cost of excavation which might have amounted to \$200,000. An ammonia-brine refrigerating system was used with 3-inch pipes placed 30 inches apart. Not only did this operation successfully stop the slide, but it saved several weeks of construction time.

An average of about 6,000 men were employed at Grand Coulee Dam. The estimated cost of the foundation section of the dam is \$62,900,000, and it will be completed about the middle of the 1938 fiscal year. A total of about 4,250,000 cubic yards of concrete will be placed under the present contract, leaving about 7,000,000 cubic yards to complete the structure. Progress during the year was very good, and the work was many months ahead of schedule.

Considerable progress was made during the fiscal year in surveys of the lands to be irrigated under the project. The work consisted of topographic mapping, section line retracement, monumenting and necessary level work, all in the Quincy Flats area. Work accomplished to date comprised 594,099 acres of retracement, 510,962 acres of monumenting, 475,925 acres of control leveling, and 347,173 acres of topography. In field mapping 192 topographic sheets were completed. About 100 men were employed on this work.

Other survey work was in progress in the reservoir site, including right-of-way surveys, and highway and railroad relocation. Studies were made of migratory fish control in cooperation with State and Government agencies.

CENTRAL VALLEY PROJECT

The Central Valley project in California, another of the major undertakings of the Bureau, is designed to regulate the flow of both the Sacramento and San Joaquin Rivers, and to redistribute, geographically, the waters of the great interior valley of the State extending from Redding to Bakersfield, a distance of 400 miles.

Through the storage and conservation of the flood waters of the two streams and their tributaries, the regulated flow of the rivers will be available for irrigation, improvement of navigation, generation of hydroelectric power, and protection in the delta region from salt water intrusion.

In the southern San Joaquin Valley, about 1,000,000 acres require supplemental water supplies for irrigation. More than 400,000 acres of highly developed agricultural lands in that area are dangerously short of water at this time, having about exhausted the underground irrigation supply. Some 40,000 or more acres have been abandoned to the encroaching desert. In the delta area where the Sacramento and San Joaquin rivers join to flow westward to San Francisco Bay there are 500,000 acres of rich lands threatened by an invasion of salt water. Regulation of the Sacramento River, a major water producer, will provide surplus water for diversion into San Joaquin Valley and a sustained flow which will prevent salt water intrusion into the delta area.

The estimated cost of the project is \$170,000,000. The principal construction features include Shasta Dam, reservoir and power plant on the Sacramento River near Redding; 200 miles of transmission lines from the Shasta power plant to a load center near Antioch; the delta cross-cut canal with a capacity of 4,000 second-feet to carry Sacramento River water to the San Joaquin River near Stockton; the Contra Costa Canal, 40 miles in length with a capacity of 350 second-feet, which will extend from Antioch to Martinez and serve with supplemental waters the cities and farms on the south side of Suisun Bay; the San Joaquin pumping system which will raise 3,000 second-feet of water from the San Joaquin delta upstream to Mendota Dam; Friant Dam and reservoir of 450,000 acre-feet capacity on the San Joaquin River, east of Fresno; the Madera Canal extending north from Friant Dam and serving lands in the vicinity of Madera, and the Friant-Kern Canal, which will serve lands south of Friant Dam.

Shasta Dam will be built of concrete masonry. It will be 560 feet in height and will store about 4,500,000 acre-feet of water. Plans for the powerhouse call for an initial capacity of 280,000 kilowatts and an ultimate capacity of 350,000 kilowatts.

During the year preliminary engineering work on several of the major features was brought to completion. Shasta dam site was selected after detailed investigation of several alternate sites including one

known as the Baird site on the Pit River and another known as the Table Mountain site on the Sacramento River.

Investigation of the Friant dam site was completed in September.

During the year six contracts were awarded for work in the Government camp at the Friant dam site and bids were received on March 3 for the first construction, a 4-mile section of the Contra Costa Canal. This contract was awarded to Haas, Doughty & Jones, and Marshall & Stacy of San Francisco, Calif., on their low bid of \$102,646. They were about to start work at the end of the fiscal year.

The office of the Chief Engineer was engaged in preparation of plans and specifications for construction work to be undertaken in the fiscal year 1938. This new work will include the following: Kennett division—relocation of the Southern Pacific Railroad from Redding to the Pit River, roadbed and structures; Sacramento and Pit River bridges; Kennett camp construction; Delta division—Contra Costa Canal, earthwork and structures; Friant division—construction of Friant Dam; Madera and Friant-Kern canals, earthwork, and structures.

BOULDER CANYON PROJECT

The principal work in progress at Boulder Dam of the Boulder Canyon project on the Colorado River between Arizona and Nevada was the installation of machinery and equipment in the power plant. On September 11, 1936, President Franklin D. Roosevelt pressed a button in Constitution Hall in Washington starting the first generator, the A-0 unit in the Arizona wing of the power-house. Four of the 82,500 kilovolt-ampere generating units in the Nevada wing of the power-house went on the line during the year. The dates of their first operations were as follows: N-2, October 26; N-4, November 14; N-1, December 28; and N-3, March 22.

On the All-American Canal system of the Boulder Canyon project, all excavation work necessary for completion of the main canal, 80 miles in length, was under contract. Part of this work had been completed, and all earthwork, estimated to total about 65,000,000 cubic yards, was expected to be done during the calendar year 1938. Work was continued on the Imperial diversion dam and desilting works. The dam is a concrete structure, 2,990 feet long, of the hollow or floating weir type, slab and buttress nonoverflow section with a maximum height of 47 feet. The desilting works consist of six settling basins, each 269 feet wide by 769 feet long. Silt deposited in the basins will be removed by 72 rotary-type scrapers, each 125 feet in diameter, and sluiced into the river below the dam.

OTHER CONSTRUCTION

On the Kendrick (Casper-Alcova) project in Wyoming, construction of the Seminole storage dam and power plant and the Alcova diversion dam continued, and at the end of the year, these were 30 and 72

percent complete, respectively. Government forces excavated 28.6 miles of the Casper Canal, moving 3,793,000 cubic yards of material. In October 1936 contracts were awarded for the manufacture of two 20,000-kilovolt-amphere generating units and turbines and governors for the Seminole power plant.

Other important dams under construction during the year were the following: Bartlett Dam, 270-foot concrete multiple arch, on the Salt River project, Arizona; Parker Dam, 325-foot concrete arch, on the Colorado River near Parker, Ariz., being built for the Metropolitan Water District of Southern California; Taylor Park Dam, 168-foot earth and rock fill, on the Uncompahgre project, Colorado; Island Park Dam, 80-foot earth fill, and Grassy Lake Dam, 120-foot earth fill, on the Upper Snake River storage project, Idaho-Wyoming; Fresno Dam, 80-foot earth fill, on the Milk River project, Montana; Alamogordo Dam, 142-foot rolled earth and rock fill on the Carlsbad project, New Mexico; Caballo Dam, 85-foot earth fill, on the Rio Grande project, New Mexico-Texas; Unity Dam, 81-foot earth fill, on the Burnt River project, Oregon; Marshall Ford Dam, 265-foot concrete, straight gravity, on the Colorado River project, Texas; Utah; Bull Lake Dam, 75-foot earth fill, on the Riverton project, Moon Lake Dam, 90-foot earth fill, on the Moon Lake project, Wyoming.

A contract was awarded for construction of the Boca Dam, 110-foot earth fill, on the Truckee storage project, Nevada. Plans and specifications were in preparation for the Deer Creek Dam on the Provo River project, Utah, the Vallecito Dam on the Pine River project in Colorado, and the Roza diversion dam on the Roza division of the Yakima project, Washington.

BUREAU'S CONSTRUCTION RESULTS

Our operations of over 35 years have resulted in the following:

138 storage and diversion dams have been built.

24 powerhouses.

2,344 buildings.

19,116 miles of canals, ditches, and drains.

72½ miles of tunnels.

4,367 miles of telephone lines.

267 miles of dikes and levees.

6,041 flumes.

18,694 culverts.

13,166 bridges.

182,964 other irrigation structures.

Reservoir capacity created by this construction totaled 44,898,910 acre-feet.

POWER GENERATION

The first of the giant generators in the Boulder Dam powerhouse went into operation in October 1936, and by April 1937 four of these were producing energy for the city of Los Angeles and other communities in that vicinity.

As a result, the total output of power from hydroelectric plants on Bureau of Reclamation projects increased tremendously. During the fiscal year 1937, 24 power plants on 12 projects produced a grand total of 1,056,757,865 kilowatt-hours of energy.

This places the Bureau of Reclamation in a preeminent position among Federal agencies in the field of electric power, although generation of hydroelectric power is a byproduct.

By the end of the year, the Boulder plant had settled into a steady monthly output of approximately 80,000,000 kilowatt-hours. Two new generators were being manufactured, and during the year bids for two additional generators were called.

Projects now in construction contemplate additional power developments in connection with dams which will control the Sacramento River in California, the North Platte River in Wyoming, and the Columbia River in Washington, and which will store their waters for use in irrigation. Use of the waters released from reclamation reservoirs to turn turbines increases the over-all efficiency of the project. In planning all Federal reclamation projects, the feasibility of including power development is investigated carefully, just as are other conservation ends.

RECLAMATION FUND

As was pointed out last year, accretions to the reclamation fund established by the act of June 17, 1902, are decreasing. From a high point of more than \$9,430,573.98 reached in 1908, accretions to the special fund from the sale of public lands fell to an all-time low of \$127,176.17 in the fiscal year 1937.

This source of revenue cannot be revived, because of new conservation policies and exhaustion of attractive farm sites on the public domain.

Again the need for new sources of accretions to the fund must be stressed. While the fund also receives repayments made by water users on operating projects, this source and the remaining productive statutory sources of accretions cannot be expected to provide sufficient money year by year to finance reclamation construction programs of the size of that now in progress.

The following table will show the accretions to the fund:

Accretions to reclamation fund, by States

States	Sale of public lands		Proceeds from oil leasing act		Total to June 30, 1937
	Fiscal year 1937	To June 30, 1937	Fiscal year 1937	To June 30, 1937	
Alabama			\$3, 113. 03	\$181, 984. 46	\$181, 984. 46
Arizona	\$11, 977. 53	\$2, 686, 498. 75	. 34	160. 20	2, 686, 658. 95
California	15, 435. 55	8, 185, 636. 64	1, 731, 599. 79	14, 089, 064. 30	22, 274, 700. 94
Colorado	9, 914. 46	10, 273, 223. 66	77, 081. 27	636, 005. 43	10, 909, 229. 09
Idaho	4, 860. 47	7, 010, 768. 12	1, 941. 17	19, 388. 23	7, 030, 156. 35
Kansas	8. 84	1, 033, 067. 60			1, 033, 067. 60
Louisiana			30, 950. 42	73, 261. 66	73, 261. 66
Montana	14, 571. 77	15, 342, 828. 34	50, 753. 91	1, 196, 121. 60	15, 538, 949. 94
Nebraska	111. 76	2, 904, 308. 58			2, 094, 308. 58
Nevada	662. 91	1, 023, 080. 10	84. 00	5, 447. 37	1, 028, 527. 47
New Mexico	24, 700. 23	6, 661, 542. 95	288, 602. 71	984, 231. 42	7, 645, 774. 37
North Dakota	564. 43	12, 218, 658. 77	15, 016. 29	152, 721. 78	12, 371, 380. 55
Oklahoma	341. 51	5, 929, 403. 06			5, 929, 403. 06
Oregon	8, 941. 62	11, 972, 330. 26		10. 28	11, 972, 340. 54
South Dakota	1, 510. 40	7, 731, 616. 90	212. 67	1, 849. 26	7, 733, 466. 16
Utah	8, 273. 25	4, 239, 302. 59	68, 144. 95	533, 726. 36	4, 773, 028. 95
Washington	1, 325. 66	7, 447, 065. 79		33, 749. 63	7, 480, 815. 42
Wyoming	23, 975. 78	8, 644, 615. 80	826, 036. 02	34, 374, 280. 19	43, 018, 895. 99
Total	127, 176. 17	112, 493, 947. 91	3, 093, 536. 57	52, 282, 002. 17	164, 775, 950. 08
Proceeds, Federal water power licenses					¹ 759, 733. 37
Proceeds, potassium royalties and rentals					² 328, 353. 79
Grand total					165, 864, 037. 24

¹ Proceeds for fiscal year, \$19,400.83.

² Proceeds for fiscal year, \$67,122.13.

REPAYMENTS

Under the reclamation law, project water users are required to contract to repay without interest over a period of years the cost of construction of the project works which serve them. Also, in instances where the project is operated by the Bureau, the water users pay annual operation and maintenance and water rental charges.

In excess of 98 percent had been collected of all moneys due and payable for repayment of construction, operation and maintenance, and water rental charges. Construction charges of \$48,268,782.16 had become due, and \$47,580,012.45 had been paid. Operation and maintenance charges of \$31,622,231.32 had become due, and \$31,392,552.88 had been paid. Water rental charges of \$9,953,628.17 had become due, and \$9,877,494.50 had been paid.

Another source of revenue was the sale of electric energy. Exclusive of the Boulder Dam power development, this source has yielded a net revenue of \$8,446,806.43.

The following tables show the status of the reclamation fund and the situation with regard to collections.

STATUS OF RECLAMATION FUND

Accretions to the fund:

Sales of public lands	\$112,493,947.91
Royalties and rental under Mineral Leasing Act	52,282,002.17
Potassium royalties and rentals	328,353.79
Federal water power licenses	759,733.37

Total accretions	\$165,864,037.24
Loan from General Treasury	15,000,000.00
Collections—construction and operation and maintenance re- payments, water rents, power and light, etc	115,006,306.45
Total cash available	395,870,343.69
Disbursements	281,856,228.52
Balance in fund June 30, 1937	14,014,115.17

Accounts Receivable, Construction Water-Right Charges

State and project	Due		Collected			Uncol- lected June 30, 1937
	Fiscal year 1937	To June 30, 1937	Cash		Other cred- its to June 30, 1937	
			Fiscal year 1937	To June 30, 1937		
Arizona:						
Salt River	\$152,490.30	\$6,963,725.01	\$152,490.30	\$6,963,725.01		
Yuma auxiliary	14,159.52	584,640.19	12,931.17	582,316.87	\$1,683.67	\$639.65
Arizona-California: Yuma	152,542.48	3,987,325.59	94,442.48	3,364,707.59	595,918.32	26,699.68
California: Orland	3,775.35	826,526.19	8,729.90	787,925.71		38,600.48
Colorado:						
Grand Valley	27,702.05	197,782.94	10,000.00	90,729.94	107,053.00	
Uncompahgre	53,552.58	543,822.06	8,125.00	435,407.43	63,652.04	44,762.59
Idaho:						
Boise	26,203.62	4,037,789.10	24,025.37	4,008,417.56	27,193.29	2,178.25
Minidoka	142,376.13	8,250,680.15	58,166.20	7,304,914.11	905,700.54	40,065.50
Montana:						
Bitter Root	36,122.26	36,122.26	18,025.42	18,025.42		18,096.84
Huntley	10,906.90	571,746.86	9,857.83	477,940.14	93,558.38	248.34
Milk River	26,090.17	97,757.73	9,864.49	12,867.25		84,890.48
Sun River	59,181.79	279,601.34	29,473.49	235,971.31	35,249.27	8,380.76
Montana-North Dakota:						
Lower Yellowstone	25,760.33	319,521.31	24,364.21	317,160.51	1,311.41	1,049.39
Nebraska-Wyoming: North Platte	166,546.40	4,270,894.15	21,663.28	2,812,192.06	1,377,815.39	80,886.70
Nevada: Newlands	28,579.04	1,235,090.58	21,685.31	1,152,994.05	79,525.90	2,570.63
New Mexico: Carlsbad	1,707.21	887,418.10	1,707.21	887,336.85	81.25	
New Mexico-Texas:						
Rio Grande	115,425.00	3,207,949.45	96,420.38	2,878,019.83	328,387.87	1,541.75
Baker	2,884.75	2,884.75	2,884.75	2,884.75		
Oregon: Umatilla	2,985.37	546,042.54	2,761.37	404,690.85	5,190.89	136,160.80
Oregon-California: Klamath	48,244.70	1,195,748.89	21,608.12	1,161,911.21	5,127.85	28,709.83
South Dakota: Belle Fourche	57,457.29	684,091.53	4,620.19	550,818.52	80,921.48	52,351.53
Utah:						
Salt Lake Basin	71,749.36	72,971.86	71,749.36	72,971.86		
Strawberry Valley	68,803.39	1,385,938.35	68,128.39	1,374,350.13	11,588.22	
Washington:						
Okanogan	5,425.94	142,901.80	425.94	137,901.80		5,000.00
Yakima	54,212.67	6,932,974.40	121,164.76	6,762,914.66	36,363.75	133,695.99
Wyoming: Shoshone	22,514.02	1,006,835.03	22,600.80	842,919.56	163,674.95	240.52
Total	1,359,079.58	48,268,782.16	902,053.38	43,642,014.98	23,919,997.47	706,769.71
Paid in advance of due dates			1302,943.97	610,665.44	188,585.93	
Refunds				98,926.60	3,212.84	
Total collections			599,109.41	44,371,607.02		
Contributed funds applying to construction cost not in- cluded in above table			39,265.07	1,816,522.40		

¹ Contra.² Other credits for fiscal year, \$290,189.52.³ Decrease for fiscal year, \$32,461.47.

Accounts Receivable, Operation and Maintenance Charges

[After public notice]

State and project	Due		Collected			Uncollected June 30, 1937
	Fiscal year 1937	To June 30, 1937	Cash		Other credits to June 30, 1937	
			Fiscal year 1937	To June 30, 1937		
Arizona: Yuma auxiliary	\$15,854.79	\$499,260.68	\$18,275.95	\$484,311.05	\$11,804.81	\$3,144.82
Arizona-California: Yuma	114,386.49	3,999,822.73	146,826.28	3,813,012.00	181,370.56	5,440.17
California: Orland	13,168.90	680,929.35	24,658.36	630,786.70	25,757.82	24,384.83
Colorado:						
Grand Valley	48,872.11	457,083.97	50,372.11	424,083.97	33,000.00	
Uncompahgre		1,008,683.69		977,809.79	30,873.90	
Idaho:						
Boise	11,483.25	2,201,650.02	11,483.25	2,149,000.30	52,649.72	
King Hill		60,711.27		59,192.22	1,519.05	
Minidoka	80,475.95	2,203,888.69	69,258.65	2,062,579.63	141,306.16	2.90
Montana:						
Frenchtown	2,000.00	2,000.00				2,000.00
Huntley		554,787.34		543,594.31	11,193.03	
Milk River	47,820.29	418,917.97	40,876.12	393,598.96	1,662.25	23,656.76
Sun River		168,718.50		164,366.28	4,352.22	
Montana - North Dakota:						
Lower Yellowstone		338,562.56		338,557.93	4.63	
Nebraska-Wyoming: North Platte	20,652.38	1,952,631.07	23,301.78	1,879,684.22	65,198.06	7,748.79
Nevada: Newlands		1,174,581.57		1,135,901.55	38,680.02	
New Mexico: Carlsbad	24,607.28	998,201.85	24,607.28	981,329.14	16,872.71	
New Mexico-Texas: Rio Grande	302,896.90	4,641,556.53	280,494.35	4,338,550.37	248,593.87	54,412.29
North Dakota:						
Buford-Trenton		2,317.41		2,317.41		
Williston		34,042.75		34,042.75		
Oregon:						
Umatilla	3,190.38	392,078.40	3,478.26	384,132.31	7,253.96	692.13
Vale	15,000.00	38,149.67	15,000.00	38,149.67		
Oregon-California: Klamath	32,541.23	1,373,510.50	32,874.36	1,338,873.62	30,536.22	4,100.66
Oregon-Idaho: Owyhee	30,318.09	30,818.09	30,318.09	30,818.09		
South Dakota: Belle Fourche	49,048.37	1,252,661.80	49,048.37	1,243,285.81	9,375.99	
Utah: Strawberry Valley		376,880.88		365,022.21	11,858.67	
Washington:						
Okanogan		371,441.72		368,788.67	2,653.05	
Yakima	223,456.98	5,830,214.97	239,164.55	5,657,994.36	69,338.24	102,882.37
Wyoming: Shoshone	1,843.05	558,127.84	1,776.93	533,209.69	23,705.43	1,212.72
Total	1,037,616.44	31,622,231.82	1,061,814.69	30,372,993.01	1,019,560.37	229,678.44
Paid in advance of due dates			28,548.81	150,748.02	² 323.41	
Penalties and interest			8,053.75	527,773.62	20,480.00	
Refunds				38,228.87	156.00	
Total collections			1,098,417.25	31,089,743.52		

¹ Other credits for fiscal year, \$31,402.48.² Increase for fiscal year, \$65.07.

Accounts Receivable, Rental of Irrigation Water

State and project	Due		Collected			Uncollected June 30, 1937
	Fiscal year 1937	To June 30, 1937	Cash		Other cred- its to June 30, 1937	
			Fiscal year 1937	To June 30, 1937		
Arizona:						
Salt River		\$2, 246, 726. 01		\$2, 246, 726. 01		
Yuma auxiliary	\$439. 90	13, 836. 83	\$787. 38	13, 836. 83		
Arizona-California: Yuma	9, 743. 23	566, 656. 25	9, 347. 72	553, 606. 55	\$12, 654. 19	\$395. 51
California: Orland	38. 88	121, 489. 73	38. 88	121, 489. 73		
Colorado:						
Grand Valley	10, 897. 60	533, 725. 86	10, 645. 00	524, 736. 93	6, 500. 67	2, 488. 26
Uncompahgre	2, 856. 99	1, 229, 317. 36	1, 905. 96	1, 221, 300. 36		8, 017. 00
Idaho:						
Boise	8, 050. 00	814, 088. 57	8, 050. 00	809, 368. 07	4, 720. 50	
Minidoka	57, 361. 56	797, 604. 60	57, 336. 56	794, 196. 59	3, 383. 01	25. 00
Montana:						
Huntley	517. 23	12, 957. 48	517. 23	12, 957. 48		
Milk River	159. 75	238, 487. 25	174. 75	228, 140. 47	1, 208. 14	9, 138. 64
Sun River	64. 35	132, 656. 90	190. 52	130, 702. 92	1, 366. 62	587. 36
Montana - North Dakota:						
Lower Yellowstone	558. 00	137, 141. 60	347. 40	136, 353. 38		788. 22
Nebraska-Wyoming: North						
Platte	2, 003. 45	348, 759. 97	1, 994. 45	348, 740. 97	10. 00	9. 00
Nevada: Newlands		28, 291. 16		22, 114. 31	6, 176. 85	

Accounts Receivable, Rental of Irrigation Water—Continued

State and project	Due		Collected			Uncollected June 30, 1937
	Fiscal year 1937	To June 30, 1937	Cash		Other credits to June 30, 1937	
			Fiscal year 1937	To June 30, 1937		
New Mexico:						
Carlsbad.....	\$242.01	\$40,741.28	\$187.26	\$40,669.28		\$72.00
Hondo.....		9,129.70		9,129.70		
New Mexico-Texas: Rio Grande.....	12,954.82	1,520,413.52	5,017.30	1,498,330.96		22,082.56
North Dakota:						
Buford-Trenton.....		31.75		31.75		
Williston.....		2,117.28		2,117.28		
Oregon:						
Umatilla.....	2,694.00	100,143.32	2,694.00	73,866.52		26,276.80
Vale.....	1,373.25	21,544.45	80.45	21,291.62		252.83
Oregon-California: Klamath.....	52,576.16	451,261.45	51,248.70	446,982.79	25.00	4,253.66
Oregon-Idaho: Owyhee.....	45,597.71	62,519.86	45,108.15	61,976.40		543.46
South Dakota: Belle Fourche.....	610.78	10,942.68	610.78	10,924.88	17.80	
Utah: Strawberry Valley.....		17,596.13		17,596.13		
Washington:						
Okanogan.....		110,645.28		108,061.09	2,584.19	
Yakima.....	2,096.75	180,079.32	2,856.60	179,449.42		629.90
Wyoming:						
Riverton.....	30,547.96	95,209.63	27,699.69	85,715.63	9,198.50	295.50
Shoshone.....	13,567.95	109,512.95	13,418.66	105,612.02	3,622.96	277.97
Total.....	253,205.83	9,953,628.17	240,257.44	9,826,026.07	51,468.43	76,133.67

¹ Contra.² Other credits for fiscal year, \$2,679.94.

Population of Projects

Population of the farms and towns served by the Federal projects exceeded this year that of any previous year.

There were 210,466 living on farms and 653,441 in towns on the projects, and serving these were 859 schools and 996 churches.

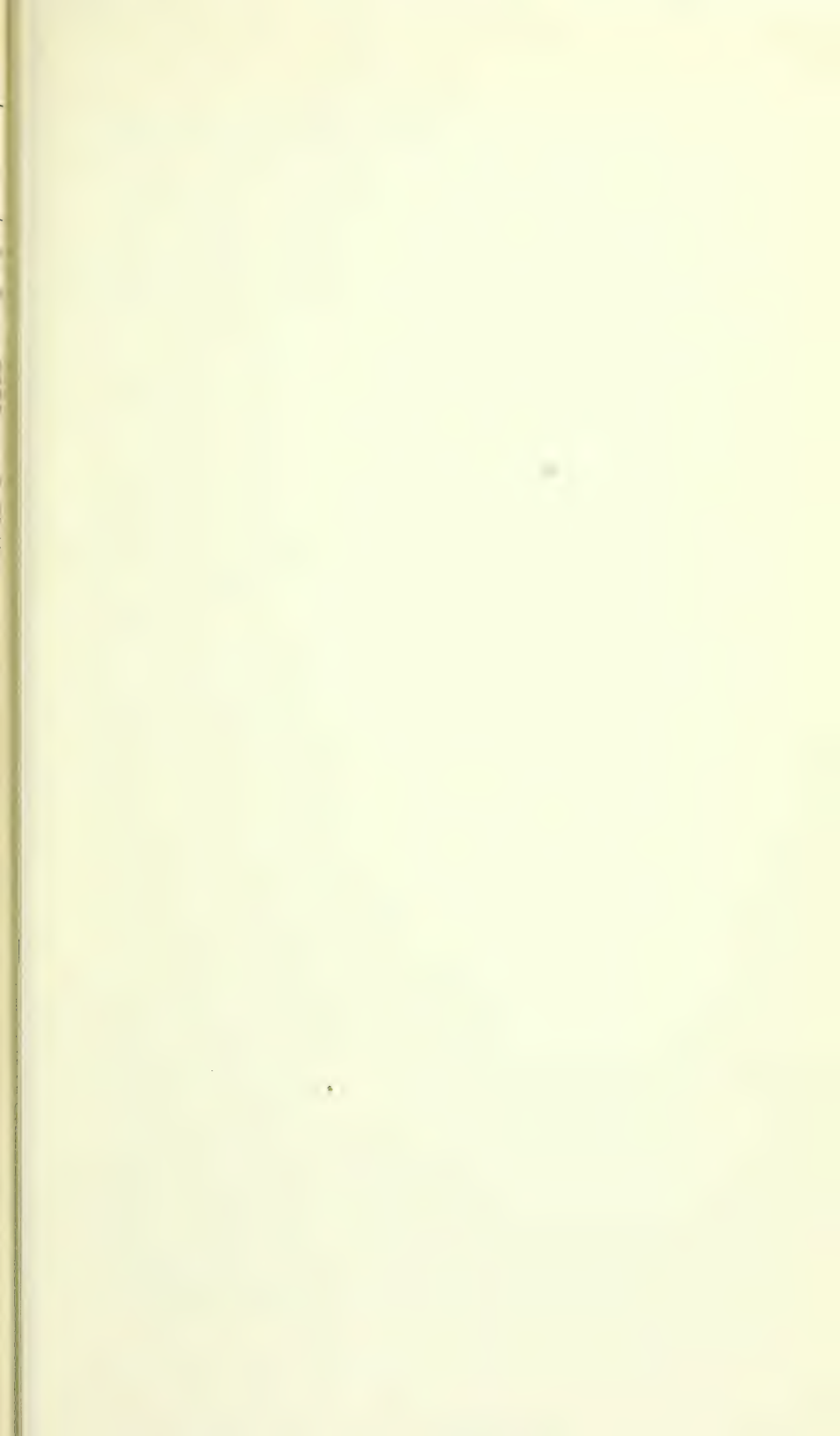
As an index to the prosperity of these people, an investigation was made of the bank deposits in banks on the projects. Deposits totaled \$226,903,747. The following table shows the population and bank deposits of each of the projects in operation.

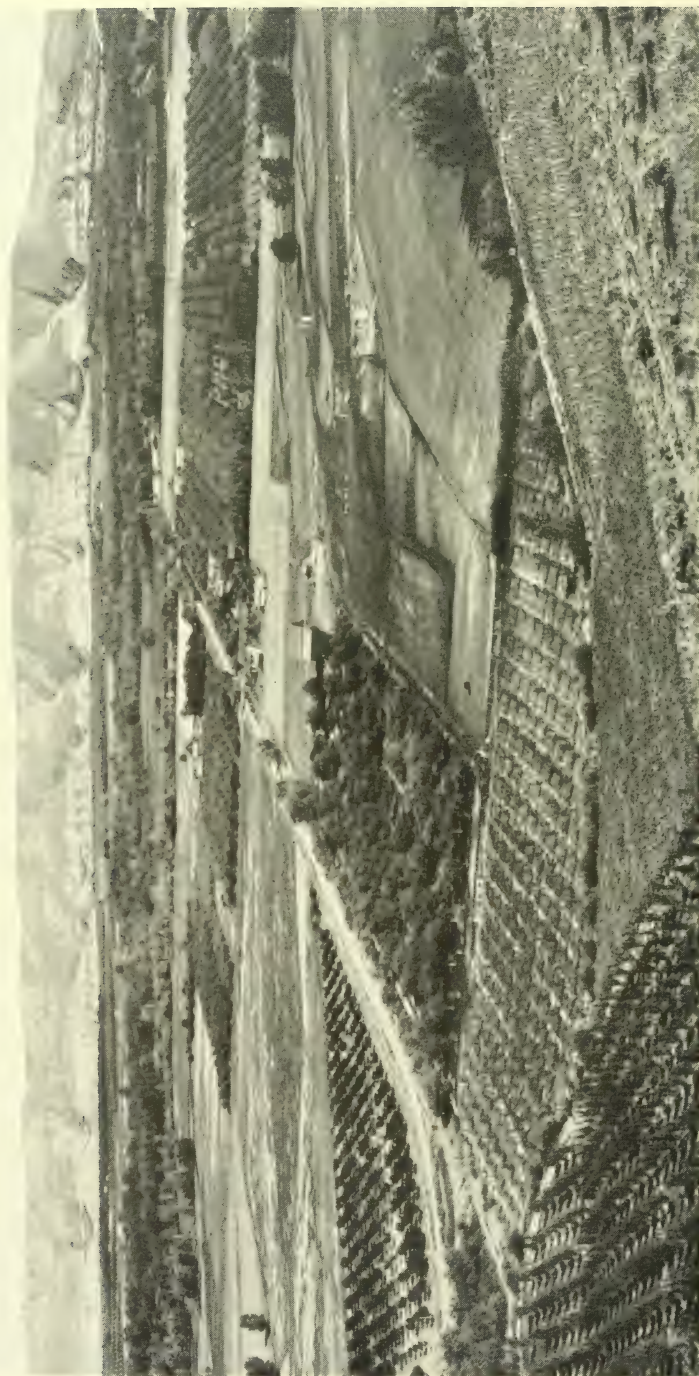
Population and Bank Deposits

State and project	Irrigated farms		Towns		Number of schools	Number of churches	Bank deposits
	Number	Population	Number	Population			
Arizona: Salt River.....	7,900	60,000	12	95,000	86	70	\$54,343,000
Arizona-California: Yuma.....	829	3,744	5	10,000	13	26	1,357,480
California: Orland.....	656	1,919	1	1,200	9	10	1,051,898
Colorado:							
Grand Valley.....	463	1,389	6	14,570	17	38	4,414,420
Uncompahgre.....	1,590	5,985	3	8,350	28	35	3,332,093
Idaho:							
Boise.....	4,010	15,550	16	50,000	58	88	31,903,747
Minidoka.....	2,425	8,418	6	7,775	22	50	(²)
Montana:							
Bitter Root.....	325	1,250	5	4,200	10	15	1,808,468
Frenchtown.....	34	120	3	17,150	15	23	8,764,093
Huntley.....	650	2,143	5	716	7	6	163,799
Milk River.....	599	2,267	17	11,015	33	34	4,903,031
Sun River.....	711	1,671	6	763	11	12	151,475
Montana-North Dakota: Lower Yellowstone.....	580	2,689	7	3,600	18	21	1,147,300
Nebraska-Wyoming: North Platte.....	3,137	9,706	18	21,503	70	51	7,132,142
Nevada:							
Humboldt.....	60	265	1	1,400	4	4	1,006,000
Newlands.....	802	2,751	4	2,020	16	12	800,000
Truckee River Storage.....	300	1,650	2	25,000	24	14	12,000,000

¹ In addition the Gooding division reported 985 farms with a population of 2,160 but no data relative to towns, schools, or churches.

² Individual data not available as 3 banks are members of a chain system.





THE YAKIMA PROJECT IN THE STATE OF WASHINGTON, ONCE A DRY AND BARREN AREA, HAS BEEN TRANSFORMED INTO ONE OF THE GARDEN SPOTS OF THE UNITED STATES.

Population and Bank Deposits—Continued

State and project	Irrigated farms		Towns		Number of schools	Number of churches	Bank deposits
	Number	Population	Number	Population			
New Mexico: Carlsbad.....	455	2, 049	4	7, 000	9	12	1, 723, 888
New Mexico-Texas: Rio Grande.....	5, 750	26, 500	37	130, 000	88	124	30, 000, 000
Oregon:							
Umatilla.....	434	1, 379	5	1, 530	8	14	380, 000
Vale.....	400	1, 260	3	1, 600	3	12	367, 758
Oregon-California: Klamath.....	882	2, 835	5	17, 425	29	35	6, 923, 569
Oregon-Idaho: Owyhee.....	1, 210	5, 380	5	5, 450	23	20	
South Dakota: Belle Fourche.....	900	2, 735	5	3, 550	28	17	2, 320, 000
Utah:							
Hyrum.....	370	1, 480	3	3, 500	5	6	
Moon Lake.....	600	2, 500	10	4, 300	17	15	308, 000
Ogden River.....	1, 195	4, 800	4	53, 962	25	56	14, 000, 000
Strawberry Valley.....	2, 200	5, 550	12	25, 000	27	26	1, 163, 300
Weber River.....	2, 100	10, 000	10	48, 000	46	50	20, 500, 000
Washington:							
Okanogan.....	391	965	3	4, 500	10	8	1, 248, 781
Yakima.....	5, 502	17, 488	23	50, 252	78	62	6, 059, 582
Wyoming:							
Kendrick (Casper-Alcova).....			4	20, 000	17	18	7, 713, 582
Riverton.....	338	1, 228	2	110	2	2	
Shoshone.....	975	2, 800	5	3, 000	3	10	543, 288
Total, 1937.....	48, 773	210, 466	257	653, 441	859	996	226, 903, 747

³ Estimated.**CROP RESULTS: PROJECT WATER USERS PROSPER**

The estimated gross value of crops produced on Federal reclamation projects during the calendar year of 1936 was \$136,502,480, or \$29,721,186 more than in 1935 and \$36,713,477 more than in 1934. With an average of \$47.10 for each of the 2,901,919 acres for which the Bureau of Reclamation furnished water in 1936, the figure represents a higher total than at any time since 1929.

During only 3 previous years, 1919, 1928, and 1929, has the gross crop returns been greater for Federal reclamation farmers. Since 1906, when the first Federal project went into operation, the grand total value of crops produced on these projects has been \$2,311,983,242, approximately 10 times the cost of the Federal irrigation works serving the lands.

The average per acre return represents an increase of \$9.80 an acre over that received in 1935, and was among the highest returns per acre in the history of the Bureau of Reclamation. The return obtained by the farmer on Federal reclamation projects for each acre he worked during 1936 was two and one-half times that received by the average farmer the Nation over.

Although the 1936 production from our projects represents only 1.1 percent of the value of all the crops harvested from farms in the United States, approximately 864,000 people on 48,773 farms and in 257 towns and cities which have sprung up in these areas were supported by the projects. With the exception of some fruits and vegetables, these crops do not reach eastern markets and more than one-half of the area is used in the production of hay and forage which is consumed on the farm and is an important factor in the support of the livestock industry of the Western States.

Irrigation and Crop Results on Government Projects, 1936

State and project	Lands on projects covered by crop census						Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts.					
	Irrigable acreage 1	Irrigated acreage	Cropped acreage	Crop value		Total	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Total
				Per acre	Per acre							
Arizona: Salt River	242,405	234,704	229,450	\$19,487,951	\$84.93		93,907	73,658	59,264	\$4,670,000	\$78.80	
Arizona: California: Yuma	69,960	52,515	49,077	3,364,003	68.60		165	165	158	26,286	166.89	
Valley Division	40,762	43,818	40,822	2,633,387	65.10							
Reservation Division	7,744	2,604	2,499	99,653	39.87							
Bard Division	6,135	4,882	4,611	221,982	48.14							
Yuma Auxiliary (Mesa)	6,319	1,211	1,145	388,981	539.77							
California: Orland	20,633	13,781	13,016	441,689	33.93							
Colorado: Grand Valley	30,413	17,285	16,940	702,086	44.99		10,027	7,555	7,236	802,899	122.00	
Uncompahgre	72,077	60,495	60,446	1,946,002	32.19		1,650	1,550	1,490	52,150	33.00	
Idaho: Boise	175,128	148,758	147,130	4,613,704	31.36		143,343	135,000	128,385	3,927,806	30.59	
New York: Nampa-Meridian Irrigation District	17,532	14,989	14,983	271,463	18.12							
Boise-Kuna Irrigation District	40,813	35,004	34,965	927,056	26.51							
Wildcat Irrigation District	48,602	43,234	43,157	1,205,297	27.53							
Big Bend Irrigation District	59,469	47,819	46,351	1,901,272	41.02							
Black Canyon Irrigation District—Notus Division	1,818	1,296	1,295	31,245	24.13							
Minidoka	6,894	6,416	6,370	277,401	43.49							
Minidoka	179,354	164,649	158,485	5,449,770	34.46		742,703	685,514	658,506	26,364,691	40.04	
Minidoka Irrigation District	69,697	59,402	55,397	2,218,476	40.05							
Burley Irrigation District	48,961	44,551	42,392	1,855,158	43.76							
Gooding Division	60,696	60,696	60,696	1,376,136	22.67							
Montana: Bitter Root	16,665	15,860	15,623	360,152	23.06							
Hamley	32,508	23,929	22,907	777,889	32.51							
Milk River	134,557	54,224	54,224	1,329,235	24.51							
Malta Division	56,652	21,523	21,523	405,385	18.84							
Glasgow Division	22,133	6,019	6,019	83,849	13.93							
Chinook Division	55,772	26,682	26,682	840,001	31.48							

Sun River.....	64,248	47,728	53,519	777,561	14.53					
Fort Shaw Division.....	8,975	7,964	7,929	166,913	21.05					
Greenfields Division.....	55,273	39,764	45,560	610,648	13.39					
Montana-North Dakota:										
Lower Yellowstone.....	58,248	43,111	42,042	1,600,652	38.07					
District No. 1 (Montana).....	38,000	29,870	28,979	1,083,586	37.39					
District No. 2 (North Dakota).....	20,248	13,241	13,063	517,066	39.58					
Nebraska-Wyoming:										
North Platte.....	234,604	206,518	182,540	7,190,056	39.39	123,550	108,445	96,342	3,387,384	35.16
Pathfinder Irrigation District.....	112,261	92,296	76,650	2,861,804	37.34					
Gering and Fort Laramie Irrigation District.....	54,805	53,970	52,125	2,632,552	50.50					
Goshen Irrigation District.....	51,368	47,851	42,530	1,507,827	35.45					
Northport Irrigation District.....	16,170	12,401	11,235	187,873	16.72					
Nevada: Newlands.....	57,971	52,901	42,554	977,323	22.98					
New Mexico: Carlsbad.....	25,055	21,712	19,391	1,148,526	59.23					
New Mexico-Texas:										
Rio Grande.....	175,102	138,802	131,645	9,665,675	73.42	78,000	45,825	45,825	1,909,291	41.66
Elephant Butte Irrigation District.....	100,176	78,443	74,281	5,297,220	71.31					
El Paso County Irrigation District no. 1.....	74,926	60,359	57,564	4,368,455	76.15					
Oregon:										
Umatilla.....	18,229	11,504	11,031	215,466	19.60	930	772	737	23,061	31.50
East Division.....	11,522	7,104	6,709	133,505	19.90					
West Division.....	6,707	4,400	4,322	81,961	18.97					
Vale.....	20,468	11,404	10,975	253,829	23.13					
Oregon-California:										
Klamath.....	60,337	50,780	50,168	3,911,045	78.10	63,410	34,780	34,613	1,488,752	43.01
Main Division.....	40,146	32,039	31,641	1,760,442	55.65					
Tule Lake Division.....	20,191	18,741	18,527	2,150,603	116.08					
Oregon-Idaho:										
Owyhee.....	31,801	8,609	7,951	253,264	31.85					
Mitchell Butte Division:										
Advancement Irrigation District.....	737	570	546	18,916	34.64					
Kingman Colony Irrigation District.....	1,531	1,294	1,204	40,999	32.44					
Owyhee Irrigation District.....	29,533	6,771	6,141	193,349	31.48					
South Dakota: Belle Fourche.....	73,093	37,546	37,546	978,142	26.05					

1 Area for which the Bureau was prepared to supply water in 1936.

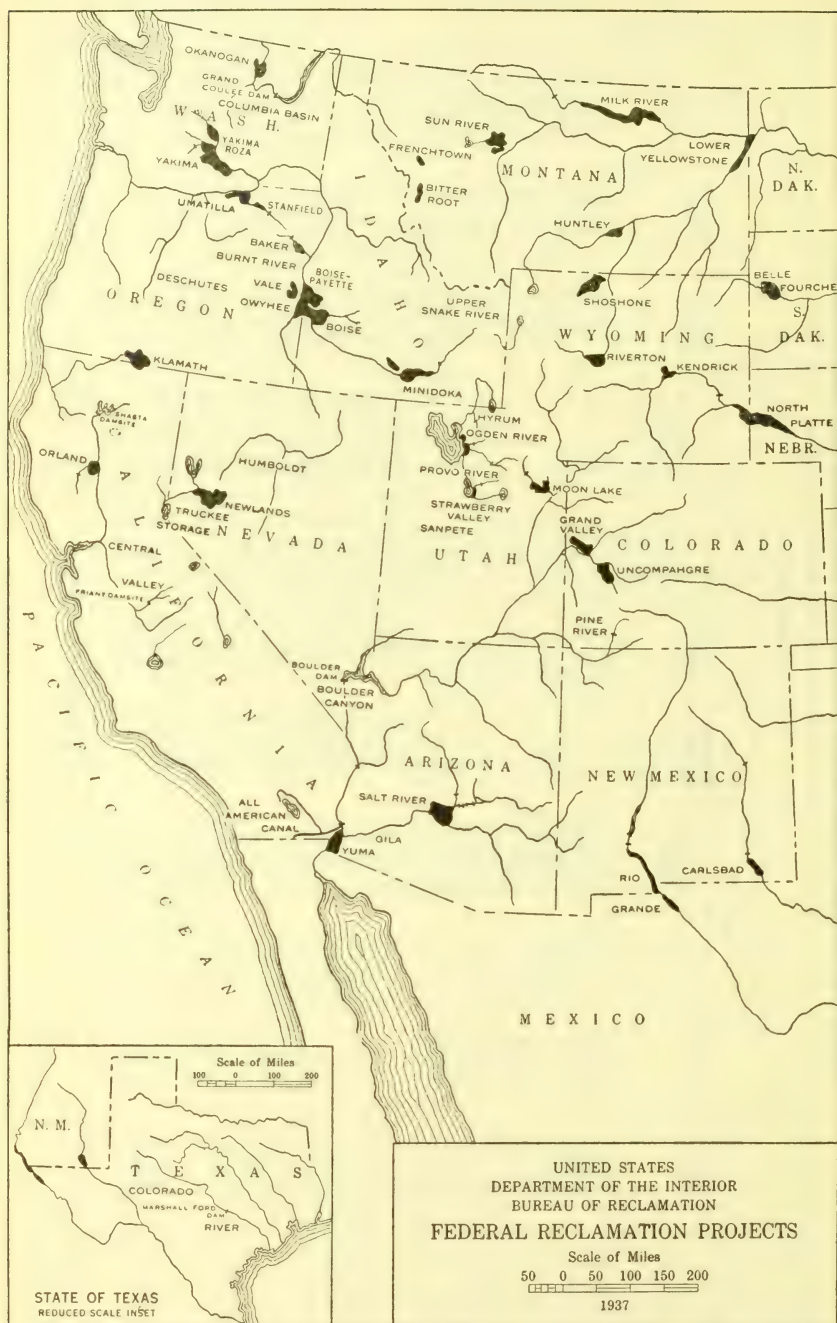
Irrigation and Crop Results on Government Projects, 1936—Continued

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water service contracts.				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Utah:										
Weber River (Salt Lake Basin)	8,000	8,500	7,488	215,827	28.82	80,000	86,500	85,243	3,876,329	45.46
Hyrum	53,889	39,255	36,132	887,941	23.19	7,544	6,950	6,838	161,594	23.65
Strawberry Valley										
High Line Division	21,886	17,694	15,120	288,002	19.05					
Spanish Fork Division	22,033	15,122	12,838	318,401	24.80					
Springville-Mapleton Division	10,000	8,439	8,174	231,538	28.32					
Washington:										
Okanogan	5,101	3,572	3,488	608,516	174.46					
Yakima	202,097	158,900	152,464	9,678,845	65.48	172,442	148,404	147,831	10,845,086	73.16
Sunnyside Division	102,117	80,023	75,553	4,528,015	59.93					
Tieton Division	29,794	25,146	24,218	3,405,500	140.62					
Kittitas Division	70,186	53,731	52,693	1,745,330	33.12					
Wyoming:										
Riverton	32,000	19,545	18,799	390,595	20.78	277	277	277	4,353	15.64
Shoshone	72,466	55,605	51,143	1,666,574	30.80					
Garland Division	41,627	31,754	31,754	1,250,861	39.39					
Frammie Division	20,031	15,194	14,154	255,350	16.62					
Willwood Division	10,808	8,657	8,235	180,393	21.90					
Grand total, 1936	2,166,409	1,702,192	1,629,174	78,902,818	48.40	1,527,008	1,335,995	1,272,745	57,599,662	45.20
Warren Act Lands	1,527,008	1,335,995	1,272,745	57,599,662	45.30					
Grand total of projects proper and Warren Act	3,693,417	3,038,187	2,901,919	136,502,480	47.10					
Grand total, 1935	3,614,095	2,935,616	2,861,136	106,781,294	37.30					
Increase	79,322	102,571	40,783	29,721,186	9.80					

Irrigated and Cropped Acreages and Accumulated Crop Values by Years, 1906-36 ¹

Year	Federal irrigation projects				Warren Act lands				Entire area			
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Cropped acreage	For year	Crop value	
			For year	Cumulative total			For year	Cumulative total			For year	Cumulative total
1906	22,300	2 20,100	244,900	\$5,005,360	2 501,100	2 431,600	\$35,000,000	22,300	2 20,100	\$244,900	2 20,100	\$5,005,360
1907	187,628	2 169,000	4,760,460	12,641,248	1,073,486	880,613	64,368,468	187,628	2 169,000	4,760,460	2 169,000	12,641,248
1908	288,549	2 369,500	7,635,888	24,561,911	1,148,115	916,313	880,613	289,549	2 260,500	7,635,888	2 260,500	24,561,911
1909	410,628	2 369,500	11,920,663	37,506,550	1,231,230	981,940	950,890	410,628	2 369,500	11,920,663	2 369,500	37,506,550
1910	562,421	413,000	13,086,441	50,592,991	1,256,046	966,550	45,288,630	471,423	413,000	12,944,639	413,000	50,592,991
1911	562,421	470,100	13,086,441	63,680,125	1,256,046	981,270	33,210,840	562,311	470,100	13,086,441	470,100	63,680,125
1912	614,477	540,000	16,007,134	82,276,534	1,256,046	981,270	37,557,860	614,477	540,000	16,007,134	540,000	82,276,534
1913	694,142	637,227	15,676,409	98,752,951	1,051,380	983,040	43,237,470	694,142	637,227	15,676,409	637,227	98,752,951
1914	761,271	703,424	16,475,517	116,916,503	1,019,170	889,460	49,750,040	810,649	703,424	16,475,517	703,424	116,916,503
1915	810,649	700,935	18,164,452	149,732,473	1,097,190	949,590	53,655,850	922,821	700,935	18,164,452	700,935	149,732,473
1916	922,821	888,291	56,462,313	206,194,788	1,097,190	949,590	53,655,850	1,026,653	888,291	56,462,313	888,291	206,194,788
1917	1,026,653	906,784	66,821,396	273,016,184	1,073,486	949,590	53,655,850	1,026,653	906,784	66,821,396	906,784	273,016,184
1918	1,119,566	1,051,193	66,821,396	339,837,580	1,148,115	1,073,486	62,495,320	1,103,568	1,532,793	1,532,793	1,532,793	339,837,580
1919	1,187,255	1,113,469	88,974,137	361,990,321	1,231,230	1,192,030	69,750,440	1,203,568	1,994,082	1,994,082	1,994,082	401,338,789
1920	1,225,480	1,153,820	66,171,650	428,161,971	1,256,046	1,256,046	72,720,460	1,203,568	2,205,420	2,205,420	2,205,420	401,338,789
1921	1,227,500	1,157,900	40,620,300	477,782,271	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1922	1,202,130	1,169,100	50,360,850	528,143,121	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1923	1,213,700	1,179,870	65,046,300	593,189,421	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1924	1,200,890	1,216,610	66,488,560	659,677,981	1,019,170	889,460	43,237,470	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1925	1,320,300	1,242,750	77,698,880	737,256,861	1,019,170	889,460	43,237,470	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1926	1,411,020	1,328,810	60,369,620	797,626,481	1,097,190	949,590	53,655,850	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1927	1,378,990	1,326,810	70,985,450	868,611,931	1,148,115	1,073,486	62,495,320	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1928	1,412,080	1,385,560	80,228,800	948,840,731	1,231,230	1,192,030	69,750,440	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1929	1,483,900	1,420,070	87,559,670	1,036,400,401	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1930	1,504,810	1,467,067	64,418,940	1,100,819,340	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1931	1,522,718	1,462,563	40,121,089	1,140,980,430	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1932	1,565,144	1,506,320	31,168,752	1,172,146,182	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1933	1,580,770	1,529,903	48,138,576	1,220,284,758	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1934	1,552,124	1,464,405	59,628,327	1,279,913,085	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1935	1,640,936	1,604,166	63,601,663	1,343,514,748	1,256,046	1,256,046	72,720,460	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789
1936	1,702,192	1,629,174	78,902,818	1,422,417,566	1,335,995	1,272,745	57,599,662	1,225,480	2,127,450	2,127,450	2,127,450	401,338,789

¹ Revised and corrected June 1937. Does not include acreages of lands cropped without irrigation and crop values therefrom.² Estimated.



SECONDARY INVESTIGATIONS

Because of inadequate precipitation for a number of years in many localities in the West where some irrigation or other farming was being practiced and because of the urgency that homes and new opportunities be provided for people from drought areas, the scope of the investigational work by the Bureau this year was greater than at any time previously.

Funds for investigation and studies of prospective projects were available from specific appropriations by the Congress, by allotments from the Public Works and Emergency Relief appropriations, and from contributions by States and other agencies for expenditure by the Bureau. Services of personnel and results of previous independent surveys and other information were furnished to the Bureau through cooperative arrangements by various States and agencies. Expenditures during the year amounted to \$588,717, of which \$11,060 were funds contributed to the Bureau.

Secondary investigations carried on during the year included the following principal features:

- Preliminary reconnaissance surveys to determine the character and extent of the problems;
- Horizontal and vertical control surveys over areas to be covered by succeeding detailed investigations;
- Topographical surveys of reservoir and dam sites, canal and tunnel locations, and of lands susceptible of irrigation;
- Geological examinations of dam and reservoir sites and of proposed tunnel and canal structure locations by test pits, diamond drilling, and other explorations;
- Location or alinement surveys of canals and laterals;
- Land classification, economic and irrigable area surveys to determine the extent and quality of the lands and their repayment ability;
- Drainage investigations by test wells and other means to determine present and probable future ground water elevations;
- Silt surveys of rivers and existing reservoirs to determine the probable rate of silting of the proposed reservoirs;
- Stream measurements and establishment of gaging stations to determine run-off;
- Assembly of information regarding existing water rights, past use of water, and crop production;
- Study of the water supply available for irrigation, power, and other uses and for determination of reservoir, tunnel, pumping plant, and canal capacities, and power development and flood control possibilities;
- Preliminary designs of dams and structures;

Preparation of general maps showing irrigated (if any) and irri-gable lands and also showing features proposed for construc-tion;

Preliminary estimates of quantities of earthwork and materials, and costs;

General report covering investigations.

All secondary investigations were conducted under the direction of the Chief Engineer. Projects examined are located in 11 States. Four of the investigations, namely the Rio Grande Basin, the Madison River diversion, the Green River-Bear River diversion, and the Colorado River Basin, involved the interests of several States. Several investigations involved proposed transmountain diversions within the same State.

In Colorado, four principal projects or groups of projects were investigated. These included:

The Blue River-South Platte transmountain diversion proposal upon which work was still in progress.

The eastern slope surveys, involving 11 more or less separate projects, contemplating irrigation, flood control, and power developments. These investigations still were in progress.

The western slope surveys, where work was continued on investigations of six projects; work was begun on investigation of four proposals, and a report was completed and issued on the Mancos project.

The Colorado-Big Thompson transmountain diversion project, upon which the final report was prepared. This project contemplates construction of the following works:

Replacement reservoir of 152,000 acre-feet capacity at the Green Mountain site on the Blue River near Kremmling; power plant of 26,000-kilowatt capacity at the Green Mountain Dam; storage reservoir of 482,000 acre-feet capacity on the Colorado River near Granby, with feeder ditches to bring the waters of Willow, Meadow, and Strawberry Creeks and Walden Hollow into the Granby Reservoir; a diversion dam on the Colorado River below the outlet of Grand Lake; pumping plant and canal along the Colorado River between the Granby Reservoir and the diversion dam; tunnel 13 miles long beneath the Continental Divide between Grand Lake and the Big Thompson River near Estes Park village; a power plant of 30,000 kilowatt capacity at Estes Park to utilize a net head of 705 feet available between the tunnel portal and power plant; 128 miles of transmission lines to connect the power plants with the Granby pumping plant; regulating reservoirs on the eastern slope at Carter Lake (110,000 acre-feet), near Lyons, Colo., Arkins (50,000 acre-feet) near Loveland, Colo., and Horsetooth (96,000 acre-feet) near Fort Collins, Colo.; diversion canals from the Big Thompson River to the regulatory reservoirs and

supply canals from the reservoirs to Cache la Poudre and Big Thompson Rivers and St. Vrain Creek.

The initial work is estimated to cost \$33,500,000, of which \$8,700,000 represents the investment in the initial power system, and will be repaid with income obtained from the sale of power produced at the power plants in excess of that required for operation of the Granby pumping plant. Water supply studies show a net annual yield of irrigation water of 310,000 acre-feet. On the basis of a 40-year repayment period, the cost per acre-foot of new water would be \$2. The ultimate project will include four additional power plants, costing approximately \$10,500,000.

A progress report on Rio Grande Basin investigations, of interest to Colorado, New Mexico, and Texas, was made to the National Resources Committee in February 1937, and at the end of the year a final report was in course of preparation. Investigations of storage possibilities in the Rio Grande Basin and for supplementing the water supply in that basin by transmountain diversion from other watersheds were continued.

In Idaho, investigations looking toward plans for the comprehensive development of the water resources of the Boise, Payette, Salmon, and Weiser Rivers were continued.

Most of the field surveys for the proposed Madison River diversion to serve lands in Montana and Idaho were completed.

In Montana, a preliminary report on Gallatin Valley investigations was issued, and final report was being prepared. A previous report on Buffalo Rapids investigations was supplemented by additional surveys and a further report was issued. A third investigation in Montana covered the Saco Divide unit of the Milk River project on which a report was prepared.

In New Mexico, a report on a plan to provide irrigation works to utilize flood waters conserved by the Conchas Dam, now being constructed by the War Department on the South Canadian River, was being prepared.

In Oklahoma, an investigation of the Altus project on the north fork of the Red River was in progress.

In Oregon, four projects or groups of projects were under investigation. Previous studies of the Canby project in the Willamette Valley, made by the War Department and Oregon, were reviewed and extended under a cooperative contract with Oregon. Investigations of the Grande Ronde project were in progress under a contract with the State, and examinations of the Butter Creek project were started. Investigations started in 1934 of the Deschutes project were completed, and reports on storage facilities, the Crooked River, and north unit, and on the Plainview project investigations were completed, while a

report on the south unit was in preparation, and investigations of the Waldo Lake was begun.

In South Dakota, the Black Hills investigations included surveys for the Angostura and Rapid City projects and completion of reconnaissance of the Belle Fourche River.

In Utah, cooperative work on Salt Lake Basin investigations, under a contract with the State, was continued on the Blue Bench, Dixie, Gooseberry, and Ouray projects, and a report on the Salt Lake aqueduct was issued. Investigations, using funds contributed by the Strawberry Water Users' Association, were continued on the proposed Currant Creek Canal diversion to increase the flow into Strawberry reservoir.

Preliminary investigations of the main features of possible plans for the utilization of the available waters of the Green and Bear River watersheds were commenced under a cooperative contract with the States of Utah, Wyoming, and Idaho.

Investigation of irrigation possibilities within the Colorado River basin were continued. The work this year consisted principally of surveys and mapping of irrigated and arable lands in Colorado and Utah.

Minor expenditures were made for investigations in the North Platte Valley, Nebraska, and southern Nevada.

EMERGENCY CONSERVATION WORK

An average of 34 Civilian Conservation Corps camps were in operation on Federal Reclamation projects, engaged in a program of reconstruction of the distribution systems by lining canals with concrete, replacing wooden water control structures with concrete structures, and realignment and restoration of canals to the original sections. Rodent control work was continued on nearly all projects. Demonstrational projects to educate project farmers to the best methods for eradication of weeds were started.

Civilian Conservation Corps construction work on the Midview Dam, on the Moon Lake project, and the Anita Dam, on the Huntley project, progressed rapidly, indicating their probable completion by the fall of 1937. The Apache Dam for erosion control on the Rio Grande project was completed and the nearby Box Canyon Dam placed under construction. Recreational developments at Elephant Butte, Guernsey, Minatare, and Lake Walcott Reservoirs had progressed sufficiently to permit partial use by the public. Cooperative work with the Bureau of Biological Survey for the development of wildlife refuges was inaugurated at the Lake Walcott Reservoir on the Minidoka project and at Tule Lake on the Klamath project.

Plans are under way for similar work at the Deer Flat Reservoir on the Boise project, and at Pishkun Reservoir on the Sun River project.

Enrollees from the camp on the Sun River project aided in combating a serious forest fire in central Montana in July and August 1936. In February, the most severe winter on record in western Nevada required C. C. C. assistance from the Humboldt project to open roads to isolated towns, ranches, and mines. In June 1937 three floods in rapid succession occurred on three widely separated projects. C. C. C. aid prevented the collapse of the McMillan Dam above Carlsbad, N. Mex., during the greatest recorded flood on the Pecos River. At Billings, Mont., C. C. C. men from the Huntley project aided in restoration of canals following floods resulting from heavy rains in the valley. At Austin, Colo., enrollees from the Uncompahgre project assisted in restoration of facilities destroyed when the nearby fruit growers dam failed.

ORGANIZATION

The Bureau of Reclamation, in administrative charge of a Commissioner appointed by the President, is under the supervision of the Secretary of the Interior. The administrative office in Washington has 100 officers and employees. Engineering and construction activities in the States are under the general supervision of the Chief Engineer at Denver, Colo., who is assisted by a staff in Denver of 800. In addition, each major project is in the charge of a construction engineer, who reports to the chief engineer. Of these there are 24.

When a project or division of a project is completed it is placed in charge of a superintendent. These operation and maintenance projects report to the General Supervisor of Operation and Maintenance at Washington.

The combined field offices, numbering 66, have a personnel of 4,750.

RECLAMATION TABLE 1.—Consolidated Financial Statement, June 30, 1937

DEBIT SIDE

Construction account:

Primary projects:

Cost of irrigation works:

Original construction.....	\$285,048,641.41
Supplemental construction.....	12,669,115.03
Value of works taken over.....	2,056,939.90

Total construction cost.....\$299,774,696.34

Operation and maintenance prior to public notice,
net.....

\$2,808,755.61

Operation and maintenance deficits and arrearages
funded with construction.....

5,512,653.07

Penalties on water right charges funded with con-
struction.....

2,250,456.17

10,571,864.85

310,346,561.19

Less income items:

Construction revenues.....

7,145,860.14

Contributed funds.....

1,831,522.40

Nonreimbursable appropriation, Rio Grande

Dam.....

1,000,000.00

9,977,382.54

300,369,178.65

Less abandoned works, nonreimbursable cost and charge-offs.....

17,118,714.60

Balance payable.....\$283,250,464.05

Palo Verde flood protection, cost of reconstruction and repairs.....48,806.46

Tennessee Valley Authority:

Cost of designs.....\$484,994.94

Less contributed funds.....484,994.94

Secondary projects and general investigations:

Cost of surveys and investigations.....

4,218,215.85

Less contributed funds.....

654,013.38

3,564,202.47

General offices' expense undistributed.....450,227.42

Plant and equipment.....1,600,193.06

Materials and supplies.....2,341,997.38

Accounts receivable:

Current accounts.....\$2,118,367.42

Deferred accounts.....211,626,725.56

213,745,092.98

Undistributed clearing cost accounts.....104,148.36

Unadjusted debits, disbursement vouchers in transit.....14,575.71

Cash:

Balance on hand:

Reclamation fund.....\$14,014,115.17

Special funds.....38,422.65

National Industrial Recovery allotments.....11,029,533.19

Emergency Relief allotments.....13,264,934.55

Funds transferred from other departments.....929,102.16

Contributed funds.....37,040.19

Central Valley project.....6,770,281.55

Grand Coulee Dam.....13,342,237.11

59,425,666.57

In special deposit and in transit.....75,653.26

59,501,319.83

Total debits.....564,621,027.72

RECLAMATION TABLE 1.—Consolidated Financial Statement, June 30, 1937—Con.

CREDIT SIDE

Security for repayment of cost of irrigation works:

Contracted construction repayments.....	\$257,611,754.27
Current accounts payable.....	7,820,974.61
Deferred and contingent obligations.....	1,255,375.36
Reserves and undistributed profits.....	9,029,628.86
Operation and maintenance results, surplus.....	594,358.48
Unadjusted credits, collection vouchers in transit.....	8,884.93

Government aid for reclamation of arid lands:

Reclamation fund..... \$165,864,037.24

Advances to reclamation fund:

Treasury loan (act of June 25, 1910)..... \$20,000,000.00
 Less amount repaid..... 10,000,000.00

10,000,000.00

Treasury loan (act of Mar. 4, 1931)..... 5,000,000.00

15,000,000.00

National Industrial Recovery allotments..... 47,601,000.00

Emergency Relief allotments..... 46,922,000.00

Funds transferred from other departments..... 1,560,000.00

General fund—Central Valley project..... 6,900,000.00

General fund—Grand Coulee Dam..... 20,750,000.00

Special funds:

Increase of compensation..... 2,797,960.33

Rio Grand Dam..... 1,000,000.00

Wind River Indian, Riverton..... 359,176.04

Judgments, United States courts..... 602,814.38

Drainage and cut-over lands..... 99,815.08

General investigations, 1923 to Dec. 31, 1924..... 266,352.66

Arid, semi-arid, swamp, and cut-over timber lands..... 35,923.75

Columbia Basin irrigation project..... 11,634.28

Colorado River levee system..... 495,110.59

Palo Verde flood protection..... 48,806.46

Claims for damages (act of Dec. 28, 1922)..... 293.23

310,314,870.04

Less nonreimbursable appropriation, Rio Grande Dam..... 1,000,000.00

309,314,870.04

Less impairment of funds:

Abandoned works..... \$2,832,134.62

Nonreimbursable construction cost..... 840,136.48

Operation and maintenance cost uncollectible..... 453,272.39

Charge-offs (act of May 25, 1926)..... 14,681,872.14

Washington office cost since Dec. 5, 1924..... 1,930,256.96

Attendance at meetings..... 1,815.90

Giving information to settlers, cost..... 11,390.22

Prepaid civil service retirement fund..... 2,340.33

Returned to Treasury, miscellaneous receipts..... 47.74

20,753,266.78

288,561,603.26

Less impounded funds, economy acts..... 261,552.05

288,300,051.21

Total credits..... 564,621,027.72

New Mexico-Texas:									
Caballo Dam.	619, 212.29	659, 908.59							619, 212.29
Rio Grande.	23, 449.94	15, 251, 467.55							13, 220, 320.73
North Dakota:									
Buford-Trenton.		223, 423.06							
Williston.		517, 630.09							
Oregon:									
Baker.		281, 591.64							
Burnt River.		214, 638.85							
Stanfield.		1, 168.15							
Umatilla.		5, 137, 937.20							
Valo.		80, 132.59							
Oregon-California: Klamath.		86, 889.25							
Oregon-Iaho: Owyhee.		806, 930.91							
South Dakota: Belle Fourche.		1, 323.88							
Utah:									
Hyrum.		9, 098.07							
Moon Lake.		440, 951.95							
Ogden.		1, 512, 489.60							
Provo River.		58, 527.00							
Salt Lake Basin.		2, 915, 885.40							
Sanpete.		117, 221.06							
Strawberry Valley.									
Washington:									
Grand Coulee.		18, 496, 707.60							
Okanogan.		1, 452, 129.45							
Yakima.		104, 773.45							
Yakima-Roza.		1, 415, 156.69							
Wyoming:									
Casper-Aleova.		2, 738, 429.88							
Riverton.		552, 881.74							
Shoshone.		22, 354.65							
Shoshone-Heart Moun- tain.		681, 889.38							
Total.		37, 787, 198.70							

1 Contra.

RECLAMATION TABLE 3.—Financial Statement, Boulder Canyon Project, June 30, 1937

ASSETS AND OTHER DEBITS

I. INVESTMENTS

102. Fixed capital under construction.....	\$105,436,620.33
103. Other physical properties.....	1,355,574.04
104. Investigations—Colorado River Basin.....	229,961.57
104. Investigations—Parker-Gila project.....	61,913.14
105. Other capital expenditures—Interest during construction.....	14,928,721.09
Total investments (schedule 2).....	\$122,012,790.17

II. CURRENT AND ACCRUED ASSETS

121. Treasury cash:	
For advances to Colorado River Dam fund.....	\$4,475,265.49
Colorado River Dam fund.....	764,562.99
N. I. R. A.—Parker-Gila project.....	5,168.92
Collections in transit.....	60,421.63
Total Treasury cash (schedule 1).....	5,305,419.03
122. Disbursing officers' cash (schedule 1).....	753,294.90
124. Accounts receivable.....	17,911.42
Total current and accrued assets.....	6,076,625.35

IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionment accounts.....	\$5,620.21
143. Field cost adjustments.....	32,611.04
145. Jobbing accounts.....	8,337.63
146. Prepayments.....	794.31
171. Unadjusted debits.....	989.83
Total deferred and unadjusted debits.....	37,112.60
Total assets and other debits.....	128,126,528.12

LIABILITIES AND OTHER CREDITS

X. CAPITAL AND LONG-TERM LIABILITY

205. Long-term liability—U. S. Treasury authorized appropriation.....	\$126,500,000.00
161. Less: Authorized but not appropriated.....	15,240,000.00
Total long-term liability:	
205.2 Appropriated but not advanced.....	4,475,265.49
205.3 Appropriated and advanced.....	106,784,734.51
205.4 Less: Impounded, legislative economy act.....	1137,653.66
206. N. I. R. A. allotment—Parker-Gila project.....	93,000.00
	\$111,215,346.34

XI. CURRENT AND ACCRUED LIABILITIES

211. Audited accounts payable:	
211.1 Contractors earnings, current.....	9,956.72
211.11 Contractors earnings, holdback.....	
211.2 Labor.....	\$41,515.42
211.3 Purchases.....	14,116.02
211.4 Freight and express.....	104,279.92
211.5 Passenger fares.....	675.31
211.9 Miscellaneous.....	7,564.53
Total audited accounts payable.....	178,107.92
214. Matured interest.....	14,903,089.51
219. Accrued interest.....	
Total current and accrued liabilities.....	15,081,197.43

**RECLAMATION TABLE 3.—Financial Statement, Boulder Canyon Project,
June 30, 1937—Continued**

XII. OTHER CREDITS	
220. Consumers' meter deposits.....	\$15.00
XIII. DEFERRED AND UNADJUSTED CREDITS	
231. Unadjusted credits.....	1,257,777.17
XV. APPROPRIATED SURPLUS	
251. Appropriated surplus not specifically invested.....	572,192.18
Total liabilities and other credits.....	128,126,528.12

**RECLAMATION TABLE 4.—Appropriations and Cash Statement, Boulder Canyon
Project, June 30, 1937**

TREASURY CASH

	Regular appro- priation	N. I. R. A. allotment	Total	N. I. R. A. Parker-Gila project
Appropriations and allotments.....	\$73,260,000.00	\$38,060,000.00	\$111,260,000.00	\$93,000.00
Advanced to Colorado River Dam fund.....	68,785,000.00	37,999,734.51	106,784,734.51	-----
Balance not advanced.....	4,475,000.00	265.49	4,475,265.49	-----
Colorado River Dam fund:				
Advanced from appropriation to fund.....	68,785,000.00	37,999,734.51	106,784,734.51	-----
Collections deposited in fund.....	1,305,172.93	21,508.13	1,326,681.06	5,168.92
Total advances and collections.....	70,090,172.93	38,021,242.64	108,111,415.57	98,168.92
Disbursements by General Accounting Office.....	4,979,642.87	54,723.63	5,034,366.50	-----
Advances to disbursing officers.....	64,346,427.98	37,966,058.10	102,312,486.08	93,000.00
Total withdrawals.....	69,326,070.85	38,020,781.73	107,346,852.58	93,000.00
Balance.....	764,102.08	460.91	764,562.99	5,168.92
Repay collections in transit.....	36.96	-----	36.96	-----
Miscellaneous collections in transit.....	60,384.67	-----	60,384.67	-----
Total Treasury cash (G. L. 121).....	5,299,523.71	726.40	5,300,250.11	5,168.92

DISBURSING OFFICERS' CASH

Advances and appropriation transfer adjust- ments.....	\$64,356,661.87	\$37,972,687.98	\$102,329,349.85	\$93,000.00
Disbursing officers' disbursements.....	64,038,626.09	37,963,381.55	102,002,007.64	67,079.06
Disbursing officers' checking balance.....	318,035.78	9,306.43	327,342.21	25,920.94
Collections by disbursing officers.....	1,767,672.37	28,107.26	1,795,779.63	5,168.92
Collections deposited and appropriation transfer adjustment.....	1,367,635.17	28,112.71	1,395,747.88	5,168.92
Collections not deposited.....	400,037.20	¹ 5.45	400,031.75	-----
Total disbursing officers' cash (G. L. 122).....	718,072.98	9,300.98	727,373.96	25,920.94

¹ Contra.

RECLAMATION TABLE 5.—Financial Statement, All-American Canal, June 30, 1937**ASSETS AND OTHER DEBITS****I. INVESTMENTS**

102. Fixed capital under construction.....	\$15,942,269.17
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II. CURRENT AND ACCRUED ASSETS**121. Treasury cash:**

For advances to Colorado River Dam fund.....	\$4,975,000.00
Colorado River Dam fund.....	113,301.74
N. I. R. A. and E. R. A. allotments.....	2,352,057.07
Contributions—Imperial irrigation district.....	22,704.46
Collections in transit.....	814.13

Total Treasury cash.....	7,463,877.40
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122. Disbursing officers' cash.....	2,877,739.29
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124. Accounts receivable.....	3,928.64
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Total current and accrued assets.....	10,345,545.33
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IV. DEFERRED AND UNADJUSTED DEBITS

141. Clearing and apportionments.....	\$14,968.74
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143. Field cost adjustments.....	401,281.53
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171. Unadjusted debits.....	25,723.83
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Total deferred and unadjusted debits.....	441,974.10
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Total assets and other debits.....	26,729,788.60
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LIABILITIES AND OTHER CREDITS**X. CAPITAL AND LONG-TERM LIABILITY**

205. Long-term liability: U. S. Treasury authorized appropriation.....	\$38,500,000.00
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161. Less: Authorized but not appropriated.....	13,000,000.00
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Total long-term liability:

205.2 Appropriated but not advanced.....	4,975,000.00
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205.3 Appropriated and advanced.....	20,525,000.00
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	\$25,500,000.00
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XI. CURRENT AND ACCRUED LIABILITIES**211. Audited accounts payable:**

211.1 Contractors' earnings, current.....	\$364,863.85
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211.11 Contractors' earnings, holdback.....	589,599.20
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211.2 Labor.....	18,019.11
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211.3 Purchases.....	44,072.07
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211.4 Freight and express.....	166,632.14
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211.5 Passenger fares.....	216.41
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211.6 Rights of way.....	
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211.9 Miscellaneous.....	616.21
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211.91 Refunds.....	358.47
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Total current and accrued liabilities.....	1,184,377.46
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XII. OTHER CREDITS

226. Contributed funds—Imperial irrigation district.....	40,000.00
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XIII. DEFERRED AND UNADJUSTED CREDITS

231. Unadjusted credits.....	\$3,932.36
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231.3 Unadjusted credits—Yuma project.....	50.50
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Total deferred and unadjusted credits.....	3,982.86
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XV. APPROPRIATED SURPLUS

251. Appropriated surplus not specifically invested.....	1,428.28
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Total liabilities and other credits.....	26,729,788.60
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RECLAMATION TABLE 6.—Appropriation and Cash Statement, All-American Canal, June 30, 1937

TREASURY CASH

	N. I. R. A. allotment	P. W. A. allotment	Emergency Relief allot- ment	Total	Regular ap- propriation	Contrib- uted funds, Imperial irriga- tion district
Appropriations and al- lotments.....	\$6,000,000.00	\$3,000,000.00	\$10,000,000.00	\$19,000,000.00	\$6,500,000.00	\$40,000.00
Advances to Colorado River Dam fund.....					1,525,000.00	
Balance not ad- vanced.....					4,975,000.00	
Advanced to Colorado River Dam fund.....					1,525,000.00	
Collections depos- ited.....	10,584.25	3,090.60	17,139.94	30,814.79	13,418.66	
Total advances, al- lotments, etc.....	6,010,584.25	3,003,090.60	10,017,139.94	19,030,814.79	1,538,418.66	40,000.00
Disbursements by Gen- eral Accounting Office.....	61,164.24	16.17	551.97	61,732.38	3,116.92	
Advances to disbursing officers.....	5,498,703.36	2,618,321.98	8,500,000.00	16,617,025.34	1,422,000.00	40,000.00
Total withdrawals.....	5,559,867.60	2,618,338.15	8,500,551.97	16,678,757.72	1,425,116.92	40,000.00
Balance.....	450,716.65	384,752.45	1,516,587.97	2,352,057.07	113,301.74	
Repay collections in transit.....			814.13	814.13		
Total Treasury cash (G. L. 121).....	450,716.65	384,752.45	1,517,402.10	2,352,871.20	5,088,301.74	

DISBURSING OFFICERS' CASH

Advances and appro- priation transfer ad- justments.....	\$5,498,878.34	\$2,618,321.98	\$8,500,000.00	\$16,617,200.32	\$1,422,000.00	\$40,000.00
Disbursements by dis- bursing officers.....	4,965,241.19	2,424,568.55	7,021,481.12	14,411,290.86	750,170.17	17,295.54
Disbursing officers' checking balance.....	533,637.15	193,753.43	1,478,518.88	2,205,909.46	671,829.83	22,704.46
Collections by disburs- ing officers.....	10,688.48	3,090.60	17,954.07	31,733.15	13,418.66	40,000.00
Collections deposited and appropriation transfer.....	10,688.48	3,090.60	17,954.07	31,733.15	13,418.66	40,000.00
Collections not de- posited.....						
Disbursing officers' cash balance.....	533,637.15	193,753.43	1,478,518.88	2,205,909.46	671,829.83	22,704.46

THE NATIONAL PARK SERVICE

Arno B. Cammerer, *Director*

THE scope of the conservation activities of the National Park Service, and their effect upon the well-being of our citizens, are vast and diversified.

The Service endeavors to meet all requests for advice and assistance that will increase and conserve park lands everywhere; and its highest ambition is to make each area under its supervision fulfill to the utmost its destiny as a unit in the conservation plan of the United States.

Popular appreciation of this fact is demonstrated in the use made of the national park system. During the 1936 travel year, which ended September 30, travel to the various units of the national park system reached the unprecedented high of 9,929,432. The increase during the following fall, winter, and spring months, together with the heavy travel at the opening of the 1937 summer season, indicates that, when the 1937 travel season ends on September 30, a new record will have been made.

From throughout the system came reports of increased registration of the visitors from foreign countries. The scenic areas of world-wide fame and the military areas took precedence in the preference of these foreign visitors.

The 1936 increase was along all lines of travel and among users of all types of accommodations. Not only were hotel and lodge quarters generally filled to capacity during the summer season, but the increasing number of park visitors traveling in trailers, as determined by a survey made during August of that year, showed a demand for many new facilities in the public campgrounds, such as electric connections and piped running water. A study as to the advisability of providing more up-to-date trailer camps is now under way. Meanwhile, special sites for trailers are being provided in most of the new campground plans.

Public interest in the national parks was stimulated by the personal interest displayed by President Roosevelt, who on July 3, 1936,



A DRIVEWAY IN THE SHENANDOAH NATIONAL PARK, VIRGINIA.



A SCENE IN THE PROPOSED BIG BEND NATIONAL PARK.

This photograph shows the mouth of Santa Helena Canyon where the Rio Grande breaks through the Mesa Angula. The bluff on the left is in Mexico and that on the right in the United States.

dedicated the Shenandoah National Park in Virginia, and who participated in the ceremonies commemorating the fiftieth anniversary of the dedication of the Statute of Liberty (a national monument) on Bedloe Island, in New York Harbor, on October 28, and dedicated the Jusserand Memorial in Rock Creek Park, Washington, on November 7. The President also visited the Great Smoky Mountains National Park, in North Carolina and Tennessee, on September 9 and motored 150 miles through the park.

Increases in the park and monument system brought the total number of areas from 135 to 140 and the total acreage from 15,496,-808.34 to 17,049,505.80 acres. As in the past, the National Capital Parks of the District of Columbia, consisting of 695 separate areas, were counted as one unit of the main park system.

In addition to its administration of park areas, the Service continued supervision of the 108 Federally owned or operated buildings and 7 memorials in Washington and of 13 buildings outside the District of Columbia; supervised plans for the Jefferson Memorial in St. Louis; supervised estimates and expenditures for the Mount Rushmore Memorial in Custer State Park, the George Rogers Clark Memorial in Indiana, and the Fine Arts Commission; supervised plans and construction of the Blue Ridge and Natchez Trace Parkways; and cooperated in the Public Works, Civilian Conservation Corps, Works Progress, and other emergency programs. The Thomas Jefferson Memorial Commission designated the National Park Service as its executive agency in the execution of the Thomas Jefferson Memorial, planned for erection in Washington, D. C., and the Director of the Service its executive officer to carry out the plans of the commission.

By Executive order, 46 recreational demonstration areas were transferred from the Resettlement Administration to the National Park Service.

To facilitate administration of the national park and monument system, which in the past 4 years expanded enormously in number of areas and functions, a plan of administration under four regions was devised. Put into effect early in the year as regards emergency activities, replacing the earlier C. C. C. seven-region plan of administration, late in the 1937 fiscal year extension of the regionalization to the National Park Service as a whole was approved by the Secretary of the Interior. Application and operation of the wider regionalization was deferred, however, until after the close of the fiscal year.

UNITED STATES TOURIST BUREAU ESTABLISHED

To fill a long-indicated need for a national clearing house of information on recreational and travel opportunities in the United States, and to stimulate interest therein both at home and abroad, the National Park Service early last winter established the United States Tourist

Bureau. This new agency began functioning in the Federal Building in New York City, but later was moved to ground floor offices at 45 Broadway, a more convenient location.

The Tourist Bureau is expected to receive the cooperation of the 48 States, the territorial and insular possessions, the District of Columbia, and various transportation and travel agencies in assembling, compiling, and disseminating tourist information. One of its purposes is to promote abroad an interest in travel to and within the United States.

A survey to determine the airport nearest to the various national and State parks was completed during the year. The purpose of the study was to keep the Service abreast of the rapid developments in transportation and to make available information on the location of existing airports for the benefit of air-minded travelers.

Radio played an important part in park operations during the past year. It was widely used for fire protection, and two rotary snow plows at Mount Rainier were equipped with sending and receiving sets so that the drivers might call for help if their machines were caught in snow slides.

Radio communication was established at Isle Royale National Park project in Lake Superior and in nine remotely located work relief camps on the North Carolina coast, where no other means of communication are available. With the cooperation of the United States Coast Guard, a radio communication system is being installed at Fort Jefferson National Monument on the Dry Tortugas Islands in the Gulf of Mexico.

Radio is regularly used for control of the annual national ski races on the slopes of Mount Rainier. Experiments are being conducted on use of ultra high radio frequencies at Grand Canyon and Death Valley, both areas particularly adapted to use of these frequencies.

FREE PARK LECTURE SERVICE

Popular acclaim of the Service's free illustrated lectures on the national parks and monuments and on specialized activities in connection therewith led to an expanding of the lecture service during the past year. Eighteen talks were given in the auditoriums of various Federal buildings, the majority in the departmental auditorium and the last three in the newly completed Interior Department Building. These lectures were attended by 11,017 persons, or an average of 612 per lecture. Plans are under way for a still further expansion of this lecture service during the 1937-38 season.

The Director of the National Park Service in his official capacity also served as a member of the National Capital Park and Planning Commission (of which he is vice chairman and ex-officio executive secretary), the District of Columbia Zoning Commission, the Alley

Dwelling Authority, National Park Trust Fund Board, Advisory Council for Emergency Conservation Work, Fredericksburg and Spotsylvania County Battlefields Memorial Commission, Petersburg National Military Park Commission, Washington-Lincoln Memorial-Gettysburg Memorial Boulevard Commission, and representative of the United States on the International Commission on Historic Monuments.

With a deep sense of sadness, and an acknowledgment of great loss, the Service reports the death on March 23, 1937, of Col. Charles Goff Thomson, superintendent of Yosemite National Park, Calif. In addition to his exacting duties as park superintendent, Colonel Thomson in his zeal for the good of the Service and in accordance with his tenets of service to humanity took on numerous other duties involving conservation of irreplaceable scenic assets which were threatened with destruction from one cause or another if not soon given the protection of the Department of the Interior.

Colonel Thomson had served as superintendent of Crater Lake National Park, Oreg., before his promotion to Yosemite, and before that had a record of excellent service for the Federal Government in the Philippines and in the World War.

The Service also suffered a serious loss in the death of Dr. Frank R. Oastler, member of the Advisory Board of National Parks, Historic Sites, Buildings, and Monuments. An ardent conservationist, Dr. Oastler for many years was keenly interested in national-park activities, especially wildlife problems, and his advice to the Service was invaluable.

VENTURE IN INTERNATIONAL COOPERATION

Amicable relations with Mexico, in the field of both conservation and international amity, were strengthened during the past 2 years through cooperation between the two countries on national-park matters.

This cooperation was the outgrowth of the suggestion of the Secretary of the Interior that the Government of Mexico be invited to consider the establishment of international parks along the frontier between Mexico and the United States. Meetings in both countries and studies of areas along the boundary have resulted in a broader understanding of the respective ideals and policies of these two North American republics.

Investigations of the Mexican portion of the proposed Big Bend National Park in Texas were made by Mexican and United States authorities, and during November tentative boundaries of the proposed park were agreed upon at joint sessions of commissions of the two countries. The plan is to link the two sections of the park, when established, by a bridge across the Rio Grande at Boquillas.

Especially interesting is the proposal, originating with Chief Forester John D. Coffman of this Service, that Mexican forestry students be detailed to forestry schools in the United States, and that fellowship awards be granted for that purpose. The matter was taken up with the Guggenheim Foundation, and that organization expressed its interest and offered its assistance, requesting that applications be obtained from promising candidates through the higher officials of the Mexican Forest Service. Applications furnished by the Foundation were transmitted through the National Park Service. It is sincerely hoped that this suggestion will lead to the establishment of Latin-American fellowships in forestry and other conservation subjects.

BOULDER DAM RECREATIONAL AREA

The value and national importance of the Boulder Dam recreational area was proved by the public use of the area during the past year and by the vast scientific interest in it displayed by specialists in many fields.

To permit development of these recreational values to the fullest extent, a cooperative agreement was entered into between the Bureau of Reclamation and the National Park Service. The agreement provides that while the Bureau of Reclamation retains complete jurisdiction and authority over and responsibility for Boulder Dam and all the engineering works connected therewith, also for the territory immediately adjacent thereto and for Boulder City and all activities located therein, the National Park Service has jurisdiction over the remainder of the Boulder Dam recreational area, including the airport on the outskirts of Boulder City and authority over and responsibility for all activities in such areas.

RECREATIONAL DEMONSTRATION AREAS

Recreational demonstration areas constitute a unique form of land use increasingly valuable to the American people, affording outlets for out-of-door recreation accessible to congested populations, and retiring from agricultural use unarable lands of no economic worth. They provide facilities for organized camping, picnics, hiking, bathing, swimming, and boating, by means of such projects as trail systems, campgrounds, beach clean-up, construction of swimming pools and dams for impounding streams, and making artificial lakes.

The National Park Service, by Executive order of November 14, 1936, was given sole responsibility for the acquisition and development of these recreational demonstration areas and is now completing acquisition of lands in the 46 areas being developed in 24 States. Funds allocated from the Emergency Relief Appropriation Act of 1935 enabled the acquisition of these areas under the Federal land program.

Forty-seven organized campgrounds are under construction in 24 recreational demonstration areas, of which 15 were completed in time to be put into use during the 1937 summer season.

Smaller areas known as waysides, contiguous to main highways, also are being developed in Virginia and South Carolina for the accommodation of those seeking 1-day outings.

Twelve thousand relief workers assigned to National Park Service projects and 4,500 C. C. C. enrollees are carrying on these developments.

While the majority of these areas will be turned over to the States for administration after development, it is planned to retain several under the jurisdiction of the National Park Service for demonstration purposes. A total of 99,513 acres of land for this purpose has been acquired; 3,607 acres during 1937.

CIVILIAN CONSERVATION CORPS WORK

The National Park Service completed 4 years and 3 months of participation in Civilian Conservation Corps work. During that period conservation projects of long-continuing benefit to the people of America have been carried on in several hundred camps located in national parks and monuments, State, county, and municipal park areas in the continental United States, the Territory of Hawaii, and the Virgin Islands.

The National Park Service supervised work programs of 91 Civilian Conservation Corps camps in national parks and monuments and 353 such camps in Federal, State, county, and municipal areas; and was responsible for camp management and work supervision over 800 Civilian Conservation Corps enrollees in Hawaii, including Hawaii National Park, and over the 400 enrollees in the Virgin Islands. Improvement both in quality and quantity of these conservation projects has been marked throughout the year. A summary of these accomplishments is shown in table 10.

EMERGENCY RELIEF ACT PROJECTS

The National Park Service derived funds both from the Emergency Relief Appropriation Act of 1935 and the Emergency Relief Appropriation Act of 1936 for land acquisition and development projects, operated on 46 recreational demonstration areas, 2 national monuments, 1 proposed national monument, 2 parkways, 2 State, 4 county, 10 municipal park areas, and 1 beach erosion control area.

These appropriations and projects gave employment to 19,000 relief workers of which 12,000 were local workers and 7,000 workers quartered in subsistence camps operated by the Service. In addition there were relief workers employed by contractors on some of the Service

projects. Three major projects included in this program are the Jefferson Memorial at St. Louis, the Natchez Trace Parkway project in Mississippi, and the North Carolina beach erosion control project.

PARK, PARKWAY, AND RECREATIONAL-AREA STUDY

A Nation-wide study of the park, parkway, and recreational-area programs in the United States was initiated. All Governors were advised to cooperate in the study. Provisions are being made for enlisting the aid and cooperation of other Federal departments and agencies.

The study is expected to result in the preparation and adoption of a comprehensive plan to serve as a guide to the States and be the basis upon which future cooperation will be extended to the States by this Department in the planning, acquisition, and development of park, parkway, and recreational areas. Similar studies also will be made on a regional basis—chiefly in areas near large population centers and frequently covering sections of two or more States—and on a national basis.

Increased consideration was given by States to the regional method of facilitating joint action in administering and developing park areas, where mutual interests and benefits are involved. During the year, by action of New York and New Jersey, the Palisades Interstate Park commission was created. At the request of Missouri and Illinois, the National Park Service is lending professional and technical aid in the formulation of plans for the creation of an interstate compact between those States for the administration and development of Alton Lake and adjacent lands, and the proposed interstate parkway leading to the lake. The Appalachian Trail conference referred to the Service its proposal for an interstate compact for the protection, extension, and development of the Appalachian Trailway from Maine to Georgia.

A three-volume digest of all laws relating to State parks was prepared and made available to park and conservation authorities. As a result of the study of these laws, principles were evolved which are now being incorporated in all new State legislation relating to parks and recreation. A compilation of all State laws relating to archeological matters also was prepared.

A municipal park study was conducted by the National Park Service in cooperation with the National Recreation Association. Material was received from 1,216 cities and 77 counties located in every State. Comparison with similar data secured in 1925 and 1930 shows the extent to which local park systems have expanded in recent years.

CONSERVATION ACTIVITIES

The National Park Service's conservation program for the protection of nature and the historic and prehistoric works of man made notable advances during the year.

As in the 2 preceding fiscal years, all forest-protection improvements, insect and tree disease control, type-mapping, and tree-preservation activities were financed from emergency appropriations. The meager allotment for forest protection and fire prevention for the fiscal year 1937 under the regular appropriation provided funds for only the most essential needs for forest protection personnel and equipment which could not be financed under the Civilian Conservation Corps program. The forest protection accomplishments of the past year are, therefore, largely represented in the report of the C. C. C. program.

The summer of 1936 was an outstandingly serious fire season with several disastrous fires within national park areas.

Extensive use of radio communication was made for protection against forest fires. Many fire lookouts have been equipped with radio sending and receiving sets, lightweight portable field sets provided for fire-fighting crews, and a few automobiles equipped with radio transmitters.

In the far West, the fire season was of unusual length, extending from early May to December in some of the parks. However, despite the high-danger weather conditions and a very material increase in the public use of the parks, the number of man-caused fires in the western parks declined and for the first time in the past 10 years was less than the number of lightning fires. Unfortunately for the National Park System as a whole, both the number of lightning fires and the number of man-caused fires showed a very material increase during the fire season of 1936 with an all-time high record total of 733.

The most disastrous of the season was the Heaven's Peak fire, in the most visited and one of the most scenic portions of Glacier National Park. Set by lightning on August 18, in spite of all reasonable precautions it was carried by a high wind across the Continental Divide, burning a total area of 7,642 acres.

Severe drought in the Lake States region, together with high winds, facilitated the spread of three fires on Isle Royale, resulting in a total burn of approximately 33,000 acres in the center of the island. As Isle Royale is as yet only a national park project, no regular protection organization was available and suppression of these fires was handled entirely by C. C. C. enrollees from national park, State park, and national forest camps, together with forestry personnel from regions I and II and the Washington office. Because of the

status of Isle Royale these fires do not appear in the annual fire statistics for the National Park System for the calendar year 1936.

During the spring of 1937 a very intensive fire protection training program was carried out in all C. C. C. camps under the jurisdiction of the National Park Service.

The taking of panoramic photographs from fire lookout stations and observation points within the National Park System was continued in an effort to improve forest fire detection and fire dispatching. Such photographs have been prepared to date for a total of 208 existing, proposed, and emergency lookout and observation points in 23 national parks and monuments.

Regular annual extensive surveys of forest insect conditions were continued during the year and a system of permanent sample plots was established in several parks to facilitate this study. The general situation in national parks within the Pacific Coast States appears fairly satisfactory as a result of the control program which has been carried on for a number of years.

The needle miner in the lodgepole stands of Yosemite still constitutes a serious menace, nevertheless, and the infestation by the mountain pine beetle in Yellowstone and Grand Teton National Parks continues to spread. The general program of control of the mountain pine beetle was abandoned several years ago because it was so widespread, affecting a number of national forests as well as parks. Some minor control is exercised in the neighborhood of developed areas.

A serious infestation by the Black Hills beetle was fought this past spring by control operations in Bryce Canyon National Park, and the Forest Service cooperated by extending operations to the adjacent national forest. There are indications that the infestation by this beetle is growing over a considerable territory and may seriously threaten the magnificent ponderosa pine forest on the north rim of Grand Canyon. Infestation in Douglas fir by the Douglas fir beetle was also combated in Bryce Canyon.

Insect conditions in the eastern parks have in general been of endemic character and where serious outbreaks of defoliators have occurred a satisfactory degree of control has been maintained through spraying. The Japanese beetle was found this spring in considerable numbers in George Washington Birthplace National Monument. The experimental autogiro spraying program for cankerworm at Morristown National Historical Park was continued with marked success. Blister rust control operations were continued in Mount Rainier, Acadia, and Shenandoah National Parks.

During the past year the C. C. C. itinerant tree-preservation crew provided the care necessary for the preservation and repair of important trees in 9 national cemeteries, 1 national park, 13 national

military and historical parks, 2 national monuments, and 3 national battlefield sites, pruning, fertilizing, installing lightning protection, removing girdling roots, bracing with rod and cables to strengthen structural weaknesses, treating wounds, and diagnosing disease and insect conditions. One additional tree-preservation bulletin was added to the series already published. Several research projects were initiated or continued in connection with callus splitting experiments, cavity filling materials, and lightning-struck trees.

The type mapping program, which provides a detailed inventory and map of the vegetative cover of the parks for use in planning protection, development, and use of the areas, was continued under C. C. C. Approximately 6,832,829 acres have been mapped to date, of which 1,236,829 acres were mapped during the past fiscal year. The data obtained in this work have provided much additional information relative to the flora of the parks and monuments covered, permitting the identification of new plants and their addition to the previous lists of known species within those areas.

Forest nurseries were operated in Sequoia, Yellowstone, Great Smoky Mountains, and Platt National Parks, raising planting stock for reforestation on burns where natural reproduction is lacking, for erosion control, and for landscape planting and replacements of dying trees in and adjacent to public campgrounds and other developed areas. In addition to the parks named, forest planting was conducted during the past year on a recent burn in Mesa Verde National Park, and on deforested areas in Scotts Bluff National Monument.

WILDLIFE CONSERVATION

As a part of the 1936 reduction program to relieve the congested northern range in Yellowstone National Park, 2 new plants of bison were made in the park, 71 animals being released in Hayden Valley and Fountain Flats as nuclei for new herds easily seen by visitors. Ten bison were shipped to zoos and seven slaughtered for use by the Crow Indian Agency.

The reduction of elk was carried on in Yellowstone National Park and vicinity in the winter of 1936-37, as in the past 2 years. Reduction of the herd by 4,000 animals was deemed necessary after exhaustive studies by park personnel and wildlife technicians indicated that, due to the extraordinary drought, the carrying capacity of the range was about one-third less than it was the previous winter.

This reduction program was undertaken by the park staff with the cooperation of the Montana Fish and Game Commission, with the understanding that as many elk as possible would be removed by live shipments and in open hunting areas outside the park. The reduction goal was not approached, since only 846 elk were removed. Mild weather in early winter and subnormal snowfall allowed range areas,

usually closed to grazing, to be used by elk. Movements of herds were slow and few elk migrated into open hunting territory. In Park County, Mont., where hunting was allowed, 256 animals were killed. Some deaths occurred from miscellaneous causes, 169 were live-shipped for restocking purposes and to zoos, and the remainder were slaughtered—the carcasses given to Indian and relief agencies. After the reduction, a census of the northern Yellowstone herd showed that 9,673 animals still remained on the range.

The past year has been one of important accomplishments in fish cultural activities within the national parks, based on the policy adopted in April 1936. There has been no further encroachment of exotic species of fish into national park waters. Lakes or streams where only native fish occur, as well as waters that do not contain any fish, received careful study with a view to protecting such waters against any artificial development.

Closer cooperation exists between the Service, the Bureau of Fisheries, and State game departments than ever before. Some 27,000,000 black-spotted trout eggs were taken in Yellowstone National Park by the Bureau of Fisheries last year, the Park Service receiving 70 per cent. Smaller amounts of eggs were taken in a number of other national parks, all being returned to the waters of the park where taken. The State of Montana collected approximately 20,000,000 rainbow and Loch Leven trout eggs at the park boundary near West Yellowstone, hatched them, and returned more than 20 percent to park waters. Egg exchanges were effected by the Service with Utah, Oregon, and Idaho, whereby park waters have been stocked by these States with no cost to the Service. More than 30,000,000 of fish were planted in the national parks during the past year and there is evidence of improved fishing conditions in many waters.

HISTORICAL AND ARCHEOLOGICAL CONSERVATION

The National Park Service program for the conservation of historic sites and buildings was greatly expanded. The historic sites survey is now under way, the field of cooperation with State and local agencies has been extended, and an agreement with the Works Progress Administration requires National Park Service approval of all restoration projects financed by relief funds. Also, the total number of historic and archeologic sites authorized or established under custody of the National Park Service has been increased to 100 with the addition of Perry's Victory International Peace Memorial and the Ocmulgee National Monument, the latter, one of the most important areas in southeastern archeology.

Considerable progress was made in the past year in putting into effect the important and far-reaching national policy for historic preservation adopted by Congress in the act of August 21, 1935.

The most significant single step was the development, with the aid of the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments, of a comprehensive plan for systematic inventory, investigation, and classification of the great number of historic sites eligible for consideration under that act. Outstanding historic and archeologic sites will be selected for public protection through ultimate inclusion within the national park system. Sites of lesser importance will be recommended for State and local protection. A policy governing restorations was also worked out with the assistance of the advisory board.

Preliminary negotiations were made toward designating certain sites as national historic sites and assuring their permanent preservation for public benefit. Among these are the following five important areas:

Derby Wharf national historic site project.—Interesting maritime project in Salem, Mass., to commemorate the importance of New England shipping in the early history of our Nation. The National Park Service took formal possession last year of the customhouse, center of the project.

Hopewell furnace and village.—Revolutionary foundry included within the French Creek recreational demonstration project in Pennsylvania. A boundary study was completed last year and the area will probably be designated a national historic site.

Harpers Ferry site.—Harpers Ferry, W. Va., had great historic significance during colonial times and during the War between the States. The project as planned will include the Jefferson Rock, the stone steps, hewn by hand from solid rock up the face of the cliff under Robert Harper's direction; the arsenal site, associated with the story of John Brown; and certain Civil War remains on the heights surrounding the town. A detailed study of recommended boundaries, comprising an area totaling 1,300 acres, has been completed recently.

Old main building, Knox College.—The only building still standing associated with the Lincoln and Douglas debates. A cooperative agreement was entered into with Knox College, Galesburg, Ill., for establishment as a national historic site.

Manassas Battlefield site.—Site of Virginia battle important in War between the States. Land acquisition was nearly completed (1,476.19 acres) and detailed research studies made preparatory to its development.

Two cooperative agreements of the type authorized by the act of August 21, 1935, permitting the Federal Government to exercise a measure of control over the historic values of structures or sites at small cost and without disturbing ownership, were drafted with State and local agencies.

The Service, through its general program of State cooperation discussed elsewhere, has contributed in an important way to the

preservation of many historic sites and structures. Thirty-two projects on areas of primary historical or archeological interest widely distributed throughout the country were in progress during the past year.

Physical improvements to established areas were made throughout the year. Stabilization of the battlefield areas through erosion control has contributed further to their permanent preservation. Interesting among the developments are the restoration of such historic structures as the Wick and Guerin Houses in Morristown National Historical Park; the Lightfoot House, Yorktown, in Colonial National Historical Park; Fort Pulaski, Ga.; the customhouse at Salem, Mass.; and the Peach Orchard, Shiloh; and the opening of bridle and foot trails to important points in battlefields of the War between the States. Fifteen visitor-contact stations were constructed in battlefield areas this past year.

ADVISORY AND TRUST FUND BOARDS

Col. Richard Lieber, of Indianapolis, Ind., was appointed by the Secretary of the Interior to fill the vacancy on the Advisory Board on National Parks, Historic Sites, Buildings, and Monuments, created by the death of Dr. Frank R. Oastler. Colonel Lieber, who is president of the National Conference on State Parks, is an outstanding conservationist and authority on park matters.

The advisory board as constituted at the close of the fiscal year was as follows: Mr. Edmund H. Abrahams, Savannah, Ga.; Prof. Herbert E. Bolton, Berkeley, Calif.; Dr. Hermon C. Bumpus (chairman), Duxbury, Mass.; Mrs. Reau Folk, Nashville, Tenn.; Hon. George de Benneville Keim, Edgewater Park, N. J.; Dr. Alfred V. Kidder, Cambridge, Mass.; Dr. Fiske Kimball, Philadelphia, Pa.; Dr. Waldo G. Leland, Washington, D. C.; Mr. Archibald M. McCrea, Williamsburg, Va.; Dr. Clark Wissler, New York, N. Y.; and Col. Richard Lieber, Indianapolis, Ind.

The National Park Trust Fund Board accepted a donation of \$3,000 from the Universal Pictures Corporation for the privilege of taking motion pictures in Yellowstone and Grand Teton National Parks. That contribution, the only one received during the fiscal year, brought the donations credited to the national park trust fund account to a total of \$8,000. No expenditures were made from the fund during the year. The membership of the National Park Trust Fund Board includes the Secretary of the Treasury, the Secretary of the Interior, the Director of the National Park Service, Mr. J. Horace McFarland, of Harrisburg, Pa., and Mr. Louis Hertle, of Gunston Hall, Va.

EDUCATION

Many new enthusiasts were enlisted in the cause of conservation last year through participation in the activities and use of the facilities provided in national parks and monuments by the National Park Service's educational program. The Service itself was able to expand this program through the availability of emergency funds and the cooperation of educational and scientific organizations.

A total of 4,550,516 educational contacts were made in the parks during the year July 1, 1936, to June 30, 1937. Visitors who listened to talks by ranger-naturalists and ranger-historians, visited museums, and participated in hikes and campfire circles gained far more than a quick-tripper's idea of the national parks.

Students under the sponsorship of various colleges and universities made tours of the different parks as part of their educational programs. Carlsbad Caverns' records of special school parties give some idea of the extent to which park areas are visited by school groups.

	<i>Total school classes</i>	<i>Number of stu- dents</i>
February 1937.....	6	148
March 1937.....	16	397
April 1937.....	63	1, 150

National Park Service information desks were extremely busy, as visitors have come to depend upon these centrally located offices for information of every kind. A growing number of parks are giving early season training to company bus drivers so that the information which they give to the public will be accurate and in accord with scientific knowledge.

Although there have been some additions to the list of publications useful to the visitor, much remains to be done to furnish adequate printed material. Yellowstone has issued another number of Trail-side Notes, providing the motorist and hiker with a guide from Fishing Bridge Museum to Mammoth Hot Springs. Yosemite has issued a self-guiding manual describing the auto tour on the floor of the valley, and a revised edition of High Waterfalls of the World. In press is a publication entitled "Birds and Mammals of Mount McKinley National Park" by Joseph S. Dixon. This has been issued by the Service designated as no. 3 in the fauna series.

MUSEUM DEVELOPMENTS

Probably the greatest progress of the year in the educational program was in museum development throughout the Service.

National Park Service museums do not present case after case of loosely organized, uncoordinated displays of documents, scientific specimens, isolated heaps of dry bones, or technical equipment.

Planned to illustrate ideas rather than exhibit collections of specimens, they tell a running story of the parks through pictures, charts, maps, models, and dioramas arranged in narrative sequence.

During the past year better housing and more effective presentation of exhibits were provided. Eleven administration buildings containing museum wings were built with P. W. A. funds. The new museum in the Interior Building is completed and exhibits depicting the aims and achievements of the Department's bureaus are in an advanced state of preparation.

Fireproof housing for the priceless exhibits already accumulated in field museums is the next important objective in museum development.

Two laboratories have prepared exhibits for displays in 31 different units of the park system, including many relief maps and models of the areas helpful to visitors in orienting themselves. Exhibits were furnished for 12 expositions and conferences during the year.

NATURALIST ACTIVITIES

Increased travel to the parks and the necessity for establishing several centers within a park to avoid overconcentration of visitors resulted in a perceptible increase in naturalist activities last year and revealed the necessity for an enlarged staff.

Campfire circles and amphitheaters suitable for evening gatherings were developed until every major park now has one or more to care for visitors who like to sit around a campfire and hear ranger-naturalists tell the story of the park and explain its major features. The smaller campfire circles encourage free and open discussion through questions and answers and entice volunteer entertainment talent, while the larger bring park wonders to life for hundreds of visitors, making them see the area with new eyes the next day. An inventory shows a total of 5 community buildings, 16 well-equipped amphitheaters, and 28 simple log circles in the parks. Lectures, as a whole, have been better planned and executed.

A gratifying number of all-day trips have been developed in practically every park and more knapsackers and pack-train parties were reported as using the trails into the back country. One of the most popular all-day guided trips was that to the top of Mount Lassen.

Campfire programs and nature hikes were inaugurated on an experimental basis in Shenandoah last year and the response by the public exceeded all expectations. The naturalist program in the National Capital Parks attracted wide attention and the attendance of 11,128 persons on field trips, 4,219 persons at campfire lectures, and ever-growing numbers on the nature trail proved the necessity for an augmented staff and additional campfire facilities.

New appointments and promotions have given added impetus to the naturalist staff. Naturalist positions have been newly established

at Boulder Dam recreational area, Death Valley National Monument, and Mesa Verde National Park, while new ranger-naturalist positions were established in Acadia, Rocky Mountain, General Grant, and at Devils Tower. More mature and better-trained men are to be found throughout the Service.

NATURAL HISTORY SCHOOLS

Excellent training for prospective national park personnel is given by the Yosemite School of Field Natural History, and its graduates are in demand for both seasonal and permanent naturalist positions.

The Secretary of the Interior has designated the field school and the Yosemite Junior Nature School as nonprofit scientific organizations engaged in a training enterprise helpful to the Service.

The field school is a full-fledged graduate school, with a college degree a prerequisite.

The instructional staff is strengthened by highly qualified professors from the University of California. The final field trip has been extended from 1 week to an expedition of 2 weeks' duration. Much flora and fauna specimen collecting is done, benefiting the Yosemite Museum through new discoveries and added scientific data. The 1937 session, constituting the thirteenth class, began its courses on June 21 with the selection of its 20 candidates (14 men and 6 women) from more than 100 applicants.

Eight graduates of the school are now employed in the Service permanently, and at least 25 more have been employed seasonally.

YALE FELLOWSHIPS

Yale University continued its cooperation with the National Park Service, furthering incentive for scholarship and training through its award of fellowships to Service employees. During each of the scholastic years of 1935-36 and 1936-37 one such fellowship was granted; and as this report is being written word has been received that two National Park Service fellowships will be awarded during the coming year.

The fellowships are open to employees of the National Park Service interested in pursuing advanced studies bearing upon the educational program of the Service or upon some special feature of interpretation activity such as field studies of wildlife, forestry, history, archeology, or museum display. A forester and an archeologist were the recipients of the previous fellowships; a historian and a geologist were selected to attend Yale next year.

HISTORICAL EDUCATIONAL ACTIVITIES

Constant efforts are being made to improve all types of educational facilities afforded the general public in the historical areas. Perhaps the most important progress last year was made in the development

of field exhibits of all kinds, including sample restorations, outdoor relief maps, orientation maps, trailside museums, and markers. Outstanding in this class was the reconstruction of the Continental Army hospital hut at Morristown in accordance with contemporary authentic records. This structure, together with reproductions of a soldier's hut and officer's hut, now presents an interesting group of sample restorations of the Morristown encampment.

As part of the educational program, public lectures sponsored by outside groups have been given by park historians and there are continued requests for this kind of service. Numerous radio broadcasts were given by the staff and opportunities offered for a series of park historical sketches.

The National Park Service cooperated with various civic organizations in conducting numerous commemorative celebrations during the year, among them being the fiftieth anniversary celebration at the Statue of Liberty, at which President Roosevelt and Secretary Ickes spoke, and reenactment of the Battle of the Crater at Petersburg, Va., attended by 50,000 people.

RESEARCH

ECOLOGICAL STUDIES

Perhaps the most notable observation to be made at the close of this third year of C. C. C. support of the wildlife division is the fact that recognition of the importance of a wildlife program in National Park Service activity has continued to grow. Maintenance of a staff of wildlife technicians through appropriations made by C. C. C. is assured for another 3-year period. During this time it is expected that provision for some permanent staff of ecologists can be made.

The work of the past year has kept the division fairly abreast of current administrative demands put upon it, but it has not been possible to enter upon the long-time program of research in wildlife needs so necessary to full understanding and adequate handling of biological assets in all areas now under the jurisdiction of the National Park Service. A satisfactory approach to the problem could be made if additional wildlife technicians were employed for the purpose of making appraisal of all biological values for which the Service is responsible.

Thirty papers covering the distribution, food habits, behavior, and taxonomy of mammals, birds, and amphibians, and management of mammals and fish in National and State parks were published.

An extended field trip was made by the supervisor of fish resources and two wildlife technicians and the most recent developments in warm water fish culture in the central United States was studied. This particular phase of the Service's fish cultural activities will be exceedingly important in the development of State park areas.

Following the spraying of woodland at Morristown National Historical Park with lead arsenate, a census of bird life was made to check possible detrimental effects. Observations indicated no material decrease of bird life but this may not yet be regarded as conclusive.

Range studies were continued at Grand Canyon, Rocky Mountain, and Yellowstone National Parks.

Studies of the nesting trumpeter swans at Yellowstone were continued. A census showed a total of 38 adults and 12 cygnets in the park in the summer of 1936, almost double the number recorded in 1935.

The survey of plants of the Great Smoky Mountains National Park was continued and about 20 species of the higher plants were added to the approximately 1,000 species represented by 4,000 specimens in the park collection.

At Glacier National Park an investigation was made of diseases and other causes of a decline in the park's bighorn population. Several bighorn have died of a disease described as *hemorrhagic septicemia* which has also caused serious losses in the Yellowstone bison herd.

Extensive wildlife studies were made in the proposed Big Bend National Park to provide data for proper management when the park is established.

Surveys were made at Oregon Caves and Fort Pulaski National Monuments with recommendations for extension of boundaries to protect native fauna and flora and historical sites, respectively.

A study of the economic food habits of the coyote at Lava Beds National Monument was started in an effort to determine the effect of that animal on the nearby Tule Lake Migratory Waterfowl Refuge.

HISTORICAL STUDIES

Research is a continuous major duty of historians in every national historical park and monument and consumes much of their time. Closer coordination of the general historical research program is being developed to assure the best possible professional standards. A master index of research subjects is being prepared and the Washington office made the clearing house for all reports. To assist the research staff, microcopying and projection equipment has been purchased for each regional office, permitting photographing of valuable documents and materials.

Among the major studies started during the past year and in progress are:

1. Fort Raleigh, Roanoke Island, Va.
2. Battle of Manassas, Virginia.
3. Battle of the Wilderness, Virginia.
4. Castle Pinckney, S. C.

5. Wakefield, George Washington Birthplace National Monument, Va.
6. Kenesaw Mountain, Ga.
7. The Second Battle of Fredericksburg, Virginia.
8. Catalog and index of Brady Civil War photographs.
9. Construction history of Fort Pulaski, Ga.
10. Brompton, Fredericksburg, Va.
11. Study of early Texas and Mexican manuscripts on Goliad Mission, Texas.
12. A study of medical practices in the Revolutionary War made in connection with the installation of exhibits at Morristown Continental Army hospital hut.

GEOLOGICAL STUDIES

The C. C. C. program made possible the continuance of geological work undertaken in previous years. The staff was kept busy supplying technical information for development of accommodations in the parks. Activities included research and advice regarding development of master and period plans; location of water supplies; appraisal of natural foundations for dams, reservoirs, bridges, and tunnels; quarrying operations for road metal, structural stone, gravel, and sand; location of roads and trails; and erosion control. Ninety-five formal reports on special projects of this type were prepared.

The geological map of the proposed Big Bend National Park was approximately 80 percent completed. The surveys show notable deposits of vertebrate fossils, including dinosaurs and a specimen believed to be the rare, toothed bird, *Hesperornis*. Invertebrate fossils, including a phenomenal 48-inch *Inoceramus Grandis*—a form of clam—were found in great profusion.

An exhaustive study was made of the stratigraphy in portions of the Boulder Dam recreational area and related territory, in an attempt to reconstruct the ecological conditions of the area in remote Permian time. In the course of this study, a den of the prehistoric ground sloth, *Northrotherium*, containing much excellent fossil material in an exceptionally fine state of preservation, was discovered in Rampart Cave.

Investigations of Meteor Crater led to the decision that the evidence favors the theory that the crater was formed by the impact of a great meteor, and hence should be included within the category of unusual and spectacular phenomena.

COOPERATIVE FIELD STUDIES

The Oberlander trust of the Carl Schurz Memorial awarded a fellowship to the Chief of the Wildlife Division enabling him to visit Germany from September to December 1936 to make special studies of administrative methods and field procedure in the central offices of the Bureau for Nature Protection and in four of the "national parks" of the Third German Reich.

Cooperation was extended to the Direccion de Parques Nacionales of the Argentine Republic and the Department of Forests, Game, and Fish of the Republic of Mexico. Conferences with the Mexican officials have continued coordinated planning of international parks, monuments, and game refuges.

By special arrangement with the United States Geological Survey, the assignment of three of its personnel to work in the national parks was continued. As a result of these assignments, material obtained in field studies in Sequoia and Yosemite National Parks was converted into museum exhibits, and portfolios are being made of park photographs descriptive of outstanding geologic features; a report describing the geology of certain routes of travel and areas of visitation in Glacier National Park was prepared; and field work in the Colorado Plateau is being transcribed into a report covering the parks of that area.

A number of additional field studies through the cooperation of interested agencies were conducted within the parks last year. The following is a partial list of some of the more noteworthy:

In Great Smoky Mountains National Park: Dr. W. H. Camp, assistant curator, New York Botanical Gardens, made extensive studies of the heath family of shrubs, trees, and herbs, preparatory to submitting a monograph on this group; Dr. W. M. Barrows, one of the leading spider authorities in the United States, made a study of the spiders of this park and estimated that there are between 700 and 800 species in the area, of which 100 to 200 are new species; Dr. L. R. Hesler, head of the botany department, University of Tennessee, collected more fungi to add to the list he has already prepared for this park; and Mr. Edwin V. Komarek of the Cooperative Quail Study Association of Thomasville, Ga., will soon publish a paper on his studies of the mammalian fauna of the Great Smokies.

In Yellowstone National Park: Dr. Leonard P. Schultz, in cooperation with the Bureau of Fisheries, investigated fish food conditions in Yellowstone Lake and other waters of the park and studied exotic fish to determine the possibility and advisability of their reduction as a menace to trout waters of the Madison River and to lakes on this river outside the park; Ranger-Naturalist James R. Simon conducted a study of fishes with cooperation of the University of Wyoming and plans to incorporate his findings in a paper on all game and forage fish of Yellowstone region; Dr. Harvey Schlundt continued his study of thermal waters and rock formations in the park; Miss Edan Lind of England devoted special attention to the plant life of Yellowstone, which she will describe to her students in botanical classes at the University of Sheffield.

Arrangements were made with Miss Elizabeth Morse of the University of California to study the fungi of Zion National Park.

Permission was given the Carnegie Institution of Washington, Department of Research in Terrestrial Magnetism, to carry on earth-current measurements in Shenandoah National Park. This institution also inaugurated a volcanological study of Crater Lake to be conducted by H. Williams of the University of California, and continued studies of the Archean rocks of Grand Canyon.

George Munro, Hawaiian ornithologist, working under the joint auspices of the Bishop Museum, Territorial Board of Agriculture and Forestry, Hawaiian Sugar Planters Association, Hui Manu, and others, conducted a survey of Hawaii National Park to compare the present status of native birds with the finds of 40 years ago.

An airplane reconnaissance of Mount McKinley was made by Bradford Washburn, Jr., in conjunction with the National Geographic Society.

Excavations in Dinosaur National Monument were continued and more of the fossil stratum uncovered to enable the American Museum of Natural History under the leadership of Dr. Barnum Brown to expose and develop a large dinosaur skeleton as an exhibit in place.

C. C. Presnall, park naturalist of Zion National Park, and Dr. E. Raymond Hall, mammalogist, University of California Museum of Vertebrate Zoology, made studies of the small animals and others indigenous to the southwestern national park region, over a 3-year period, followed by comparative studies at the Museum of Vertebrate Zoology, Berkeley, Calif., with the discovery of new facts indicating that the red bat and kangaroo bat are comparatively abundant in that area. Their findings have been published through the Utah Academy of Sciences under the title of "Ranges and Relationships of Certain Mammals in Southwestern Utah."

Recognition has been given 11 nonprofit scientific and historical organizations, engaged in cooperative park educational work through official designation by the Secretary of the Interior, in accordance with the Interior Department Appropriation Act for the fiscal year 1937, approved June 22, 1936, Public Law No. 741.

PLANNING AND CONSTRUCTION

Behind the successful handling of millions of visitors to national park areas lies a record of exact and careful planning and of construction activities that appear only incidentally, if at all, in the finished picture. The retention of primitive conditions, where use intrudes upon nature, would be impossible without the skill of the landscape planner and the engineer, who find means to install the necessary facilities and make the needed adjustments with the least possible disturbance of natural conditions.

Planning and construction activities continued under four major programs during the past year—the regular Interior Department

Appropriation Act's provision for road and trail construction, Public Works, the C. C. C., and Works Progress.

Under the Public Works program all general development, engineering, architectural, and landscape architectural plans for \$2,150,000 worth of general physical improvements were prepared. Under the roads and trails appropriation of \$6,500,000 carried in the 1937 Interior Department Appropriation Act, plans for and inspections of major road projects were made, and minor roads and trails were constructed.

Similar service was rendered by the engineering and landscape personnel under the Works Progress program, which included physical improvements, recreational developments, road and parkway construction, and land utilization work to the extent of \$1,500,000, on a wide variety of areas—Federal, State, and local, including recreational demonstration areas.

In the contract plans for nearly all road projects were included plans and drawings for bridges, parking areas, guardrails, headwalls, special grading, and other essential items.

In addition to roads and trails, buildings, electric elevators, dam and intake structures, sea walls, reservoirs, pumping plants, water supply and distribution plants, drainage systems, sewerage systems and sewage disposal plants, telephone and power lines, cribbing, and retaining walls were constructed or improved. In Washington, construction projects included such diversified duties as altering the south front of the Civil Service Building to permit street widening, and elimination of fire hazards at the White House.

Considerable surveying and mapping of both old and new areas of the national park and monument system were accomplished.

PARKWAY DEVELOPMENT

The parkway projects, which are perhaps the most spectacular new phase of national park planning and development during recent years, continued to hold popular attention.

Two new sections of the Blue Ridge Parkway project, totaling 15 miles, were placed under contract, bringing the total mileage under contract in both Virginia and North Carolina to 135 miles. Development of two recreational areas along this parkway was also continued, as were location work and right-of-way developments for bridge and overpass structures. Additional studies were made of the parkway route in the vicinity of the Great Smoky Mountains National Park.

Contracts for the construction of 34 miles in three Mississippi sections of the Natchez Trace Parkway were awarded. Survey and location work was continued in collaboration with the Bureau of Public Roads.

ENGINEERING ACTIVITIES DIVERSIFIED

Data on soil mechanics for use in the field resulted from research carried on in the engineering laboratory. Most of the material so obtained was incorporated in the Manual for the Design of Low Dams prepared for the water resources committee. This work attracted such favorable attention that the laboratory was visited by the chief engineers of almost every Federal agency. It also received marked attention and interest at a recent meeting in New York City of the American Society for Testing Materials.

The value of soils investigations, particularly in the construction of earth dams, is rapidly becoming recognized, and the increasing number of samples submitted by the field for analysis is taxing the available laboratory personnel and space to the limit.

Routine engineering work included periodic inspections of Government-owned and rented buildings with a view to insuring the preservation of the buildings and the safety of the occupants, particular attention being paid to elevators and to floor loads imposed by safes, files, and storage.

Technical service on a broad range of problems was rendered other governmental and semigovernmental agencies by the engineering staff of the National Park Service, such work being done on a reimbursable basis. Typical examples of this cooperation were the construction of the Petroleum Experimental Station of the Bureau of Mines at Bartlesville, Okla., and the investigation of air-conditioning contracts effected under the jurisdiction of the Bureau of Agricultural Engineering of the Department of Agriculture.

All major road construction, both under the regular roads and trails appropriations and under Public Works allotments, was handled for the National Park Service by the Bureau of Public Roads of the Department of Agriculture, continuing the excellent cooperation initiated under the interbureau agreement established in 1926. Landscape planners and engineers of the National Park Service, in cooperation with Bureau engineers, checked and approved all preliminary locations, surveys, and plans for road construction.

HISTORIC AMERICAN BUILDINGS SURVEY

The survey of historic American buildings, for the purpose of measuring and recording all important examples of the builders' art erected in the United States and its possessions before the last quarter of the nineteenth century, went into its fourth year of cataloging, measuring, and recording such structures. The total product of the Historic American Buildings Survey to June 30, 1937, included approximately 14,000 measured drawings of 2,100 buildings and 16,000 photographs of 3,500 buildings, in addition to the data sheets and reference cards for these and additional structures. Most of the records have

been deposited in the Library of Congress, where they are available for public use and reproduction. In conducting the work of the Historic American Buildings Survey, the structures in each locality in greatest danger of destruction are measured first.

The result of a national plan sponsored by the Department of the Interior through the National Park Service, in conjunction with the Library of Congress and the American Institute of Architects, the Historic American Buildings Survey during the past year was conducted largely through the facilities of the Works Progress Administration. The Works Progress phase of the program necessarily was discontinued at the end of the fiscal year because of a sharp reduction in Federal projects of that nature, due to curtailment of funds, although in some of the States additional Works Progress Administration projects were set up.

SERVICES BY PARK CONCESSIONERS

Operations of accommodations for the public on the concession basis were continued and extended during the year. Two new major contracts were awarded. After advertising three times for bids for the construction and operation of tourist facilities in the Shenandoah National Park, a 20-year contract was awarded the Virginia Skyline Co., Inc., of Richmond, Va.

A 20-year contract also was awarded the Grand Canyon-Boulder Dam Tours, Inc., for the installation and operation of facilities for the accommodation of visitors to the Boulder Dam recreational area.

The number of contracts and permits for the furnishing of tourist accommodations in the national parks on June 30 totaled 139. These various operations are under the supervision and control of the Department of the Interior, to which are submitted annually, for review and approval, schedules of rates for accommodations or services rendered and annual reports showing the financial status, details of income and expense, and resulting profit or loss.

The contract of the Mesa Verde Park Co. was taken over by the Mesa Verde Co., with the approval of the Department. Ansel F. Hall, former Chief of the Field Division of Education, is a director in the new company and in active management of its affairs. It is believed that Mr. Hall's enthusiasm, and his experience based on 20 years' connection with the National Park Service, will result in the building up of an operation on a high standard.

Although operating expenses of the concessioners steadily increased during the past two seasons, substantially no increases in rates have been authorized by the Department. Nevertheless, the park operators were able, by reason of increased volume and lessons in economy learned in the depression days, to maintain generally standard rates for the various accommodations and services furnished.

As a check in the avoidance of excessive rates, orders were issued that no increases be made in salaries or other compensation of corporate officers, managers, or other employees of park operators working under profit-sharing contracts who receive compensation at a rate of more than \$5,000 until approved by the Director of the National Park Service.

Field studies of rates for public-utility services in several of the parks resulted in establishing certain new rates and altering some old rates. At Yellowstone National Park charges that will reimburse the Government \$11,000 annually are being set up for telephone, water, and garbage disposal service furnished to the park concessioners. A similar review of services and rates in Mount Rainier National Park, when its findings are put into effect, will return an additional \$1,200 annually to the Government. The charges are based on depreciation, maintenance, and operating costs.

With the heaviest travel season in the history of the National Park Service in prospect during 1937, additions and improvements in facilities were made in all of the national parks and monuments. Since the improvements made in Yellowstone National Park, which were particularly noticeable and needed, were typical of those generally shown throughout the system, a résumé of betterments in that park will indicate progress generally.

In the Yellowstone, after a partial shut-down of several years, the old hotel at Mammoth Hot Springs was almost completely dismantled and rebuilt. A new dining room and grill combination commenced operation of the regular park season on June 20. During the coming year construction will begin on the new cabins and new recreation center, to be built between the hotel and dining room. This layout represents a new idea in the planning of facilities for the public in the Yellowstone, bringing all types of services into one center instead of having them scattered in more or less widely separated units, as in the past. Consolidation of the larger park operators into the present Yellowstone Park Co., effective at the beginning of the 1936 season, made possible this new line of development. The Lake Hotel, closed for several years, was again opened to the public.

The purchase of 41 new busses, representing the latest ideas in sightseeing equipment, marks the second step in the rehabilitation and modernization of the Yellowstone fleet of approximately 400 busses, probably the largest sightseeing fleet in any resort area in the world.

Authorization was given for remodeling the Government-owned Painted Desert Inn at the Petrified Forest National Monument, and work was continued on the concession buildings being erected at Bandelier National Monument by the Service. Operation of these facilities under the concession system is expected within another year.

The National Park Service undertook and is continuing supervision of the construction of a hotel at McKinley Park Station, at the entrance to Mount McKinley National Park, Alaska, under an allotment of funds by the Public Works Administration to the Alaska Railroad. In addition to the hotel structure itself, a complete utility plant must be constructed to provide heat, light, water, and sewage disposal facilities. This hotel, located along the line of the Alaska Railroad, will be operated by that organization, but will furnish much needed accommodations to McKinley Park visitors.

Cooperation and active participation was continued in the management of the concession operations of the Welfare and Recreational Association of Public Buildings and Grounds, Inc., in Washington, D. C., and in the Mammoth Cave operating committee at Mammoth Cave, Ky., both nonprofit distributing agencies furnishing accommodations for the public. Charles L. Gable, chief of the park operators division of the branch of operations, continued to represent the Director of the National Park Service in these organizations. The entire profits from the Mammoth Cave operations are donated to the United States for the purpose of purchasing additional land to complete the Mammoth Cave National Park. The Welfare and Recreational Association pays one-half of its profits to the United States as revenue, using the remaining half for welfare and recreational purposes within the District of Columbia.

Constant vigilance was maintained, through inspections of fire hazards, to prevent fires in buildings throughout the national parks. An automatic sprinkler system was installed in El Tovar Hotel at the Grand Canyon and improvements made in the Mammoth Cave Hotel in the Mammoth Cave National Park.

A safety committee was established within the National Park Service for the purpose of establishing standards for fire protection and accident prevention.

A comprehensive study of the accident problem was made by the Secretary's committee on health and safety, and a report with recommendations submitted. The chief of the Service's safety division was chairman of the interbureau committee on health and safety.

PROTECTING THE PUBLIC HEALTH

Permanent all-year administrative and protective personnel in the major units of the national park system and a visiting list approaching 12,000,000 annually entail serious responsibilities toward the safeguarding of health. With the continued cooperation of the Public Health Service this phase of Park Service work was handled successfully.

Broadly speaking, the work was divided into two main channels, studies of water-supply problems, including examination of the sources

of drinking water and bacteriological tests of water used, and the development or continuation of adequate sewage-disposal facilities. Special attention was paid to sanitary facilities in automobile campgrounds and swimming pools were inspected regularly.

Among the more outstanding developments of the year in the field of sanitation were the design of sewage-disposal facilities for the areas of concentration in the Shenandoah National Park, the near completion of a sewage disposal plant for the Smokemont area of the Great Smoky Mountains National Park, and the preparation of plans for a temporary sewage-disposal plant at Upper Basin in Yellowstone National Park, and for improvements of sewage disposal facilities at the South Rim of the Grand Canyon, in Yosemite Valley, and at Carlsbad Caverns.

CHANGES IN THE NATIONAL PARK AND MONUMENT SYSTEM

The national park and monument system on June 30, 1937, consisted of 26 national parks, 2 national historical parks, 72 national monuments, 11 national military parks, 8 national battlefield sites, 8 miscellaneous national memorials, 11 national cemeteries, 1 national parkway, and the National Capital Parks unit. The total represented by the above areas is 17,086,671.31 acres, a gain of 1,594,733.31 acres during the past year. New national monuments account for 1,218,019.73 acres of this increase.

Five new national monuments were established during the fiscal year, and four memorial areas administered in connection with public buildings maintained were given the status of miscellaneous national memorials. These four are the Washington Monument, the Lincoln Memorial, the Ford Theater, and the house where Lincoln died, now the Lincoln Museum.

NEW NATIONAL MONUMENTS

The five new monuments are: Ocmulgee National Monument, Ga., established December 23, 1936, by Presidential proclamation under authority of the act of June 14, 1934 (Public, 350, 73d Cong.); Zion National Monument, Utah, established January 22, 1937, by Presidential proclamation; Joshua Tree National Monument, Calif., established August 10, 1936, by Presidential proclamation; Organ Pipe Cactus National Monument, Ariz., established April 13, 1937, by Presidential proclamation; and Perry's Victory and International Peace Memorial, Ohio, established July 6, 1936, by Presidential proclamation, in accordance with the act of Congress of June 2, 1936 (Public, 631, 74th Cong.).

ACQUISITIONS TO PARK AREAS

Net increase to the national park and monument system through adjustment of boundaries of existing areas, and lands acquired for authorized areas amounted to 378,867.77 acres, as follows:

Acadia.—Donation of 18.30 acres and the accurate compilation of the areas heretofore acquired resulted in increase of total acreage of the park to 15,940.09 acres.

Blue Ridge Parkway.—Donations of 1,781.52 acres of land, all in the State of North Carolina, bring to 4,147.36 the total acreage now deeded to the United States for the Blue Ridge Parkway.

Chickamauga and Chattanooga.—A conveyance by the United States of 44.62 acres to the county of Catoosa, Tenn., for a road reduced the total area of the military park to 8,584.48 acres.

Colonial.—Acquisition of 222.16 acres through donation and purchase and an accurate compilation of the area heretofore acquired resulted in a total area of 6,301.50 acres for this historical park.

Death Valley.—By proclamation of March 26, 1937, 305,920 acres were added to the monument, making a total of 1,907,720 acres.

Fort Pulaski.—Donation of 277.39 acres and transfer of 130 acres from the War Department increased the total area of the monument to 427.39.

Fredericksburg and Spotsylvania.—Donation of 9.29 acres of land increased the total area of the battlefield park to 2,285.28 acres.

Great Smoky Mountains.—Donation of 16,805.50 acres brought the total area of this park to 411,688.50 acres.

Guilford Courthouse.—Donation of 11.50 acres resulted in a total area of 136.84 acres for this military park.

Hot Springs.—Donation of 1.50 acres increased the total park area to 983.99 acres.

Isle Royale Project.—Acquisition of 28,810.20 acres and the transfer of 10,266.35 acres from the public domain bring the total to 39,076.55 acres available for this park project.

Kennesaw Mountain.—Acquisition of 110.10 acres through donation and purchase resulted in a total area of 170.10 acres for the battlefield park.

Mammoth Cave.—Acquisition of 5,488.24 acres through donation and purchase resulted in a total park area of 34,620.31 acres.

Montezuma Castle.—By proclamation of February 23, 1937, 320 acres were added to the monument, making a total of 521.41 acres.

Natchez Trace Parkway.—Donations of 3,788.14 acres of land, all in Mississippi, were made for this proposed parkway.

Ocmulgee.—Donation of 173.60 acres increased the total area of the monument to 688.48 acres.

Petersburg.—Acquisition of 151.64 acres through donation and purchase brought the total area of this military park to 1,850.10 acres.

Shenandoah.—Acquisition of 4,141.94 acres through donation and purchase resulted in a total park area of 180,571.38 acres.

Tonto.—By proclamation of April 1, 1937, 480 acres were added to this monument, making its total area 1,120 acres.

PROPOSED EXTENSIONS OF EXISTING NATIONAL PARK AREAS

The National Park Service is actively interested in the proposal to extend the boundaries of the Grand Teton National Park, Wyo., to include the Jackson Hole country and an area now lying within the Teton National Forest which surrounds Jackson Lake. This area includes Emma Mathilda and Two Ocean Lakes. Satisfactory adjustments have been made with reference to the administration of the proposed extension as it relates to the adjacent national forest, and efforts are now being made to adjust the remaining difficulties in the way of park extension.

An exceptionally beautiful forest of sugar pines adjacent to Yosemite National Park, and traversed by one of the main entrance roads, has been threatened with devastation by logging. Public protest resulted in the passage of legislation, June 1937, authorizing use of Federal funds for the purchase of approximately 7,000 acres of the finest section of this forest.

NOTE.—The Third Deficiency Act, approved August 25, 1937, appropriated \$2,005,000 for the purchase of these sugar pines.

This extension would abolish the Grand Canyon National Monument, adding approximately 57 percent of its area to the Grand Canyon National Park, Ariz., returning the remaining area, comprising some 118,000 acres of private and public land, to the public domain, principally for grazing purposes. A bill (H. R. 7264) containing such provisions, was introduced in the first session of the Seventy-fifth Congress.

To bring into the Kilauea-Mauna Loa section of Hawaii National Park an area to the southeast containing a shoreline and one of the few remaining unspoiled native villages on the archipelago was the purpose of a bill (H. R. 1995) passed on April 19, 1937, by the House of Representatives.

STATUS OF NATIONAL PARK PROJECTS AUTHORIZED BY CONGRESS

A brief statement is given below regarding the progress made during the past year on some of the national park projects authorized by Congress:

NATIONAL PARKS

Early in 1937 a bill was introduced in the Texas Legislature providing for an expenditure of \$750,000 for the purchase of lands for park purposes. The bill was not enacted.

The Everglades National Park Commission, appointed by the Governor of Florida, recently recommended that Florida Bay, Key Largo, and the Turner River section be eliminated from the proposed park. The Service has expressed its disapproval of the proposal and has

conferred extensively with the Everglades Park Commission. The Department is now studying the commission's recommendations.

Through an allocation of \$705,000 from an emergency appropriation, and an appropriation of \$100,000 by the State of Michigan, 28,810 acres have been purchased and the work by C. C. C. camps at this location has gone forward. The remaining funds make possible the acquisition of 76,210.83 acres now under contract or option, and 15,000 acres now in the course of condemnation.

NATIONAL MONUMENTS

The Badlands National Monument, South Dakota, was authorized by the act of March 4, 1929 (Public No. 1021). The State of South Dakota is now negotiating with the General Land Office of this Department for the exchange of the State lands within the project for Federal lands outside the area. The act of Congress of June 26, 1936 (Public No. 827), authorized an addition to include certain lands contiguous to the proposed Badlands National Monument, provided the entire monument area when established does not exceed 250,000 acres.

The act of March 19, 1936 (Public No. 480), provided for the establishment of the Homestead National Monument, Nebraska, and authorized the appropriation of \$24,000 for the purchase of lands. That item was included in the 1937 Interior Department appropriation bill presented to Congress.

The act of June 29, 1936 (Public No. 840), authorized the establishment of the Whitman National Monument, Washington, as soon as the necessary lands are donated to the Federal Government. The National Park Service has been informed that the Whitman Centennial, Inc., and the Walla Walla Trust Foundation are now in a position to donate certain of the lands and to obtain scenic easements for the remainder.

PROPOSED ADDITIONS TO THE NATIONAL PARK SYSTEM

During the fiscal years 1935 and 1936 preliminary investigations of potential national park and monument areas reduced the number of proposed additions on the active list from 224 to 156.

Major areas now under consideration are summarized below:

PROPOSED NATIONAL PARKS

Rare examples of landscape beauty, unusual forest conditions, and vanishing species of wildlife will be preserved in the proposed Mount Olympus National Park in Washington. The forest of the Olympic Peninsula is the highest expression of the wilderness, once typical of the Pacific Northwest, but now shrinking so rapidly under the axe that protection should be extended to it at the earliest opportunity. The Wallgren bill (H. R. 4724) to establish the park, provides for

elimination of certain costly private lands included in the former bill, and of certain other areas of commercially available forest. It proposes adding some areas of scenic timber line country.

The Kings River region has been urged for many years as a national park. The chief opposition to park establishment was based upon the hydro-electric power potentialities of the canyon. Careful re-examination of the proposed park area in 1936 by the National Park Service in cooperation with other Federal agencies resulted in elimination of two important power dam sites. Thus the principal objections to the establishment of the park have been removed, without sacrificing any of the outstanding scenic features, auguring more favorable action on the proposal in the future.

Following investigation of the Green Mountains, Vermont, area in the autumn of 1936, the Department of the Interior has approved the submission to Congress of legislation authorizing its establishment as a national park.

At the request of the Governor of Maine, a preliminary investigation of the Mount Katahdin area was made in the spring of 1936. Representative Brewster, of Maine, introduced a bill (H. R. 5864) in Congress, authorizing the establishment of the Mount Katahdin National Park.

PROPOSED NATIONAL MONUMENTS

Following investigation of the Capitol Reef area in Utah a proclamation establishing it as a national monument was prepared for submission to the President.

Escalante, Green River, and the Kofa Mountains areas along the Colorado River watershed are being considered for establishment as national monuments, pending further study of power and grazing rights.

In the spring of 1937 the Wyoming State Legislature appropriated funds for the purchase of Fort Laramie, Wyo., on the Oregon Trail. Transfer of the fort to the Federal Government for establishment as a national monument is now under consideration.

The Tuzigoot ruins in Arizona, excavated and restored under the supervision of archeologists, indicate that three major southwestern cultures were present simultaneously in the prehistoric past. The owners of the property desire to donate it to the Federal Government for national monument preservation.

PROPOSED NATIONAL SEASHORES

Surveys were made in 1935 of 20 areas along the Atlantic, Gulf, Pacific, and Great Lakes shores to locate desirable areas for public recreation. At the end of the fiscal year a bill (H. R. 7022) was pending in Congress to authorize establishment of the Cape Hatteras National Seashore in North Carolina.

NATIONAL CAPITAL PARKS

During the fiscal year 1937 many of the major projects started in previous years under the authority of the Public Works Administration, the Works Progress Administration, and the Civilian Conservation Corps Administration were completed. These included several approved projects of many years standing, and as a result numerous major features of the ultimate plan for the development of the National Capital Parks system have become established. Chief among these projects were the Mall and Union Square, rehabilitation of small parks and triangles within the boundaries of the old city and of Meridian Hill Park, Fort Bunker Hill and Fort Dupont Parks, the Palisades Field House and Playground, and Pierce Mill. In addition to the foregoing, important progress was made toward the development of Theodore Roosevelt Memorial Island, the Fort Drive project and the Arlington Memorial Bridge approach. Work on the George Washington Memorial Parkway completed during the year included rough grading and drainage for the parkway extension between Arlington Memorial Bridge and Key Bridge and the preliminary development of the Leiter estate, which was acquired during the year. This property is located on the Virginia shore of the Potomac approximately 2 miles upstream of Chain Bridge.

Landscaping operations were continued in section 1, Rock Creek and Potomac Parkway, located between Constitution Avenue and K Street. A new bridle path paralleling the roadway was also constructed in this section and the height of the sea wall was raised 3 feet as a protection against minor floods. In section 2 of Rock Creek and Potomac Parkway, between K and P Streets, a program for the landscaping of side slopes was continued during the year.

The development of additional recreational facilities in accordance with the approved plan for the establishment of a recreation system for the National Capital was also an important accomplishment.

The Potomac River reached flood stages on April 27, threatening section 1, Rock Creek and Potomac Parkway, East and West Potomac Parks. Serious damage by the flood was averted through the erection of a sand bag dike. Four companies of Civilian Conservation Corps enrollees, 600 Works Progress Administration workers, and 300 regular employees of the office were utilized in the construction of the dike.

The White House greenhouses and propagating gardens for the National Capital Parks were maintained and operated. The total number of plants propagated was 298,731. Approximately 10,000 deciduous and evergreen shrubs, 20,000 deciduous and evergreen vines, 3,000 trees, 3,000 rose bushes, and 36,000 bulbs were planted. Included among the trees planted were 1,105 single-flowering Japanese cherry trees in East and West Potomac Parks.

The total attendance in the National Capital Parks during the fiscal year was estimated at 48,000,000. Permits totalling 23,809 were issued for the use of 445 recreational facilities established at 50 locations throughout the capital parks system. The facilities were used by 3,887,895 persons, of whom 2,381,644 were active participants and 1,406,250 were spectators. The naturalist activities, mentioned elsewhere in this report, drew a total attendance of 42,660 persons at 205 educational events.

MAINTENANCE OF FEDERAL BUILDINGS

Continuing the building-maintenance operations entrusted to it when the operations of the former Office of Public Buildings and Public Parks of the National Capital were consolidated with Federal park administration, the National Park Service at the close of the fiscal year was entrusted with the maintenance, operation, and protection of approximately 19,800,000 square feet of floor space, 17,500,000 of which were located in 45 Government-owned buildings and 2,300,000 in 63 rented buildings in the District of Columbia, and also of seven memorials; and similar service was provided in 13 Government-owned buildings outside the District with a total floor area of over 1,298,000 square feet. The old Custom House at Salem, Mass., comprising approximately 11,520 square feet, and the new Museum Building at Morristown, N. J., which has a floor area of about 19,000 square feet, are the latest acquisitions of out-of-town buildings. Employees required and funds expended incident to providing this service were as follows:

	Expenditures	Personnel
Buildings in the District of Columbia.....	\$6, 407, 215	¹ 4, 778
Buildings outside the District of Columbia.....	531, 000	² 252
Total.....	³ 6, 938, 215	5, 030

¹ Includes 343 temporary and 32 intermittent.

² Includes three temporary.

³ Does not include amount expended for physical improvements.

With an appropriation of \$1,150,000 granted in the Deficiency Act approved June 22, 1936, a program of physical improvement, repair, and installation in the Federal buildings of the District of Columbia was undertaken in an effort to eliminate hazards to life and property.

The service of the Central Heating Plant was extended during the year to include additional sections of the Agriculture Building, South, the South Interior Building, Interior Garage, Agriculture Annex, Federal Home Loan Bank Board, Federal Reserve, and the building at 2115 C Street NW., occupied by the Headquarters Company, United States Army. The heating load was increased by

408,000 square feet equivalent radiation, or 102,000 pounds of steam per hour, as a result of these extensions. The Central Heating Plant now furnishes an uninterrupted supply of steam to most of the Federal buildings in the District of Columbia and to a few nongovernmental buildings such as the Corcoran Art Gallery, American Red Cross, and the Panama Canal Office. The connected load at the close of the year equalled the full capacity of the plant with five of the six boilers in operation. Actual output of steam for effective heating of all buildings connected to the mains of the plant is 840,000 pounds of steam per hour.

A total of 94,000 short tons of coal was consumed during the year, the total steam generated being over 2,000,000,000 pounds. Although the heating load was increased, the milder winter of 1936-37 resulted in the consumption of less fuel than during the previous season.

Operation of the guard school was continued. Two additional subjects were introduced—pistol practice and use of other firearms and first aid. The course of instruction was increased from 6 to 44 hours per week.

Another of the wartime structures, that known as Temporary Building No. 7, at 1800 C Street NW., was demolished. Headquarters Company, United States Army, formerly housed in the building, was transferred to the former Mayfair Apartment, at 2115 C Street NW. The Research Building, formerly located on the northeast corner of Nineteenth Street and Constitution Avenue, also was razed.

SPACE-CONTROL PROGRAM

Responsibility for the allotment of space to various Federal agencies in the District of Columbia continued to rest in the National Park Service. During the fiscal year 93 leases and 33 renewals of leases were authorized, and the amount of space leased by the Government in the District at the close of the year was 2,889,448 square feet in 128 buildings housing 21,837 employees, at an annual rental of approximately \$2,720,786. Seventy-seven space allotments were made other than leases and 275 moves were accomplished. Less than half the buildings in which quarters were leased were maintained and operated by the National Park Service.

FEDERAL BUILDING PROGRAM

Under the direction of the Secretary of the Interior, who was appointed by the President as chairman of a committee to draft a 5- and 10-year Federal building program in the District of Columbia, a subcommittee collected data on present housing needs for Federal activities and estimated needs 10 years hence.

New Interior Department Building

At midnight on January 23, the Procurement Division of the Treasury Department which constructed the new Interior Department building, transferred that building to the National Park Service for maintenance, operation, and protection.

APPROPRIATIONS, DONATIONS, AND REVENUES

APPROPRIATIONS

Appropriations for the National Park Service for the fiscal year 1937 amounted to \$18,962,903. Of that amount, the sum of \$16,122,-080 was included in the Interior Department Appropriation Act, 1937; \$908,410 in the District of Columbia Appropriation Act, 1937; \$143,098 in the Independent Offices Appropriation Act, 1937, for the maintenance of the Executive Mansion and grounds; a deficiency sum of \$130,000 for emergency reconstruction and fighting forest fires; a deficiency sum of \$421,315 for public buildings and grounds in the District of Columbia; a supplement of \$10,000 for the improvement of the water system in Mesa Verde National Park; a supplement of \$78,000 for improvements to the Executive Mansion and grounds; and a supplement of \$1,150,000 for improvements to public buildings in the District of Columbia.

EMERGENCY RELIEF FUNDS

In addition to the regular appropriations, financing of activities under Public Works Administration, Works Progress Administration, and Emergency Conservation Work allotments was continued, the funds so available from the close of the 1937 fiscal year being as follows:

Public Works, 1933-37

Construction of roads and trails.....	\$26, 762, 558. 20
Construction of physical improvements.....	12, 030, 475. 97
Land acquisition for recreational demonstration projects.....	1, 449, 657. 80
Total.....	40, 242, 691. 97

Works Progress, 1935-37

Administrative expenses.....	720, 800. 00
Administrative expenses of transient camps.....	601, 451. 00
Acquisition of land for recreational demonstration projects.....	894, 166. 28
Development of Federal recreational park projects.....	1, 562, 481. 61
Beach erosion control project, North Carolina (Federal).....	679, 925. 00
Development of non-Federal recreational park projects.....	4, 144, 327. 00
Development of Federal recreational park projects.....	7, 418, 515. 00
Survey and construction of Natchez Trace Parkway.....	1, 425, 185. 00
Acquisition of site and development of Jefferson National Expansion Memorial.....	6, 750, 000. 00
Repair of 1936 flood damage, District of Columbia.....	77, 240. 00
Total.....	24, 274, 090. 89

Emergency Conservation Work, 1933-37

National parks.....	\$18, 850, 620. 75
State parks.....	57, 404, 588. 00
Territory of Hawaii.....	2, 386, 167. 33
California-Pacific National Exposition exhibit.....	5, 153. 79
Acquisition of lands on Isle Royale for E. C. W.....	705, 000. 00
Virgin Islands.....	356, 187. 79
Acquisition of land, colonial.....	188, 000. 00
Acquisition of Crater property at Petersburg National Military Park for E. C. W.....	29, 750. 00
Purchase of lands for E. C. W.....	2, 325, 000. 00
Total.....	82, 250, 467. 66

CASH DONATIONS

Cash donations to the National Park Service for the fiscal year ended June 30, 1937, amounting to \$265,543.91, were deposited in the United States Treasury and were expended under the same fiscal regulations that govern in the expenditure of Federal appropriations. Donations for the 1936 fiscal year totaled \$315,281.80.

REVENUES

The revenues received during the fiscal year 1937 amounted to \$1,398,691.66, as compared with revenue receipts of \$1,136,533.68 in the 1936 fiscal year.

PUBLIC WORKS

The allocation of Public Works funds allowed for the continuation during the fiscal year 1937 of road and trail construction work and various other types of physical improvements necessary in the administration, protection, and improvement of the park and monument areas under the jurisdiction of the National Park Service. Because of exercised care in the selection of projects together with their geographical distribution, there resulted the greatest possible financial spread and maximum of relief to the unemployed in the vicinity of the far-flung areas administered by the National Park Service in the United States, Hawaii, and Alaska.

The total allocation of Public Works funds to the end of the 1937 fiscal year, as compared with allocations for the fiscal year 1936, was as follows:

	Fiscal year 1936	Fiscal year 1937
Roads and trails.....	\$26, 839, 415. 44	\$26, 762, 558. 20
Physical improvements.....	11, 716, 414. 83	12, 030, 475. 97
Land acquisition for recreational demonstration projects.....		1, 449, 657. 80
Total.....	38, 555, 830. 27	40, 242, 691. 97

The increase of Public Works allotments for the fiscal year 1937 over the fiscal year 1936 is \$1,686,861.70. The greatest portion of this increase is an allotment of \$1,449,657.80 for the purchase of land for recreational demonstration projects.

CONCLUSION

The foregoing report is primarily a statement of what the National Park Service is doing to make the various units of the national park and monument system accessible to and comfortable for the visiting public, and to promote understanding of their priceless exhibits. Conservation of the areas without use could be obtained by a strict guardianship of the areas without development; but use combined with conservation requires a technique unique to national park work.

Through the availability of emergency relief funds and workers, great advances have been made in all lines of park conservation and development with the single exception of furnishing adequate informational service to visitors and prospective visitors through the printing and distribution of sufficient supplies of booklets and leaflets to meet the public demand.

Establishment of new Federal areas, and even more the consolidation of all Federal park areas under the National Park Service, would seem to presuppose the giving of service based upon that already proved so successful in the older western national parks. An integral part of that service is the furnishing of general information circulars. Yet with a greatly augmented system from the standpoint of areas, with phenomenally increasing interest in and visitation to the national parks, with more cooperating agencies desiring printed information upon the national park areas and upon National Park Service policies, and with the establishment of a new travel bureau destined to spread the gospel of national parks abroad and at home, the funds available for printing informational material are steadily decreasing. During the 1938 fiscal year actually less printing funds will be available for the National Park Service than were available in 1932, despite the fact that there were only 58 areas under the jurisdiction of the Service in that year as against 139 at the close of the 1937 fiscal year; and that during the 1932 travel year 3,754,596 persons visited the national park and monument system as against 9,929,432 for the 1936 travel year. An estimated increase of 25 percent is looked for during the present travel year, based upon attendance during its first 9 months.

Even the above does not give the whole picture, for, of the exceedingly limited printing funds, a much larger proportion must be diverted to administrative printing than in 1932, because of the expansion of the system both in number of areas administered and in new duties occasioned by increased size and use.

A degree of relief in this situation was obtained by the issuance of informal, exceedingly inexpensive leaflets primarily on the historic and archeological areas of the system through the Department's multilithing service. The ban placed on multilithing such leaflets through the Comptroller General's decision of August 3, 1936, has worked a serious hardship upon the Service in its furnishing of information, since printing of such leaflets is impossible with existing funds.

Too great emphasis cannot be given to the desirability of securing additional printing funds to enable the Service to meet the public demand for literature not only on the western scenic national parks, for most of which a very inadequate supply of booklets is available, but also for the newer eastern scenic parks and the many historical parks and monuments throughout the country for which there is practically no printed material for distribution.

NATIONAL PARK TABLE 1.—Holdings Acquired for National Park and Monument Purposes

Parks, monuments, and parkways	Holdings acquired from July 1, 1936, through June 30, 1937					Holdings acquired prior to July 1, 1936, in acres	Total holdings acquired through June 30, 1937, in acres	
	Holdings acquired by purchase			Holdings acquired otherwise than by purchase				Total acquired in acres
	Government funds	Donated funds	Area in acres	How acquired	Area in acres			
Acadia National Park.....				Donation.....	18,300	18,300	15,408,907	
Black Canyon of the Gunnison National Monument.....				do.....	90,000	90,000	165,000	
Blue Ridge Parkway.....				do.....	1,781,520	1,781,520	2,365,840	
Colonial National Historical Park.....	\$189,400.00		220,964	do.....	1,200	222,164	4,147,360	
Fort Pulaski National Monument.....				do.....	407,330	407,330	6,372,663	
Fredericksburg and Spotsylvania National Military Park.....				do.....	9,290	9,290	407,330	
Glacier National Park.....	104,304.78	\$104,304.78	1,056,350	do.....			2,443,440	
Grand Canyon National Park.....				Exchange.....	3,018,850	3,018,850	5,096,560	
Grand Canyon National Monument.....				do.....	5,542,310	5,542,310	31,748,870	
Great Smoky Mountains National Park.....				Donation.....	16,805,500	16,805,500	9,280,710	
Guilford Courthouse National Military Park.....				do.....	11,500	11,500	411,688,800	
Hot Springs National Park.....				do.....	1,500	1,500	11,500	
Isle Royale National Park project.....	144,211.00		28,810,200	do.....			80,700	
Kennesaw Mountain National Battlefield Park.....	8,080.00		100,100	Donation.....	10,000	110,100	28,810,200	
Mammoth Cave National Park.....	79,247.48		2,820,300	do.....	2,667,944	5,488,244	110,100	
Natchez Trace Parkway.....				do.....	3,788,136	3,788,136	30,026,004	
Ocmulgee National Monument.....				do.....	173,600	173,600	3,788,136	
Petersburg National Military Park.....	24,720.51		123,400	do.....	173,600	173,600	514,880	
Petrified Forest National Monument.....	60,400.00		2,717,180	do.....	28,240	151,640	688,480	
Shenandoah National Park.....	33,886.50		3,776,875	do.....	365,060	2,717,180	1,698,460	
Yosemite National Park.....				Donation.....	159,900	4,141,935	23,529,320	
Acres acquired in other areas prior to July 1, 1936.....				do.....			26,246,500	
							176,519,020	
							180,660,955	
							39,547,480	
							30,707,389	
							189,559,885	
Total.....	653,250.27	104,304.78	39,625,309		34,881,140	74,506,509	792,781,905	
Grand total.....							982,141,790	

*Includes 10,729.50 acres outside of the minimum area required for the establishment of the park.

NATIONAL PARKS TABLE 2.—Automobile and Motorcycle Licenses Issued and Revenues Received, Fiscal Years 1936-37

Name of park	1936			1937		
	Auto- mobiles	Motor- cycles	Revenue	Auto- mobiles	Motor- cycles	Revenue
Crater Lake.....	30,718	-----	\$30,718	42,754	-----	\$42,754
General Grant.....	3,100	-----	3,100	10,092	-----	10,092
Glacier.....	23,896	50	23,946	30,662	86	30,748
Grand Canyon.....	55,721	-----	55,721	65,601	-----	65,601
Lassen Volcanic.....	8,947	10	8,952	14,051	11	14,062
Mesa Verde.....	5,008	-----	5,008	6,093	-----	6,093
Mount Rainier.....	39,187	-----	39,187	53,693	-----	53,693
Sequoia.....	38,289	-----	38,289	33,908	-----	33,908
Yellowstone.....	86,313	272	259,596	110,429	348	331,635
Yosemite.....	84,926	192	170,064	99,732	206	199,670
Zion.....	28,495	-----	28,495	37,620	-----	37,620
Total.....	404,610	524	663,076	504,545	651	825,786

NATIONAL PARKS TABLE 3.—Appropriations, Expenditures, and Revenues, Fiscal Year 1937

Name of park	Appropriated	Expenditures and obliga- tions	Revenues received
Acadia.....	\$46,000.00	\$44,653.26	\$405.50
Bryce Canyon.....	12,000.00	11,908.88	-----
Carlsbad Caverns.....	64,000.00	62,634.06	238,705.81
Crater Lake.....	62,600.00	66,595.62	45,384.72
General Grant.....	15,000.00	14,728.62	10,039.40
Glacier.....	175,000.00	172,339.68	39,621.91
Grand Canyon.....	113,500.00	114,228.52	82,055.89
Grand Teton.....	19,900.00	20,070.74	232.67
Great Smoky Mountains.....	59,900.00	56,924.94	8,097.44
Hawaii.....	45,600.00	44,687.84	1,725.62
Hot Springs.....	71,200.00	68,803.97	36,662.00
Lassen Volcanic.....	28,400.00	32,238.66	14,083.78
Mammoth Cave.....	-----	-----	117.50
Mesa Verde.....	47,250.00	48,016.48	6,903.11
Mesa Verde deficiency.....	10,000.00	105.92	-----
Mount McKinley.....	25,000.00	24,487.54	227.60
Mount Rainier.....	121,800.00	126,502.85	57,478.51
National Capital Parks, United States.....	166,000.00	163,654.44	11,182.54
National Capital Parks, District of Columbia.....	908,410.00	891,469.01	-----
Platt.....	20,600.00	20,251.17	2.00
Rocky Mountain.....	82,000.00	80,152.50	1,617.25
Sequoia.....	99,500.00	106,090.11	55,412.57
Shenandoah.....	39,800.00	38,615.55	1,437.98
Wind Cave.....	15,900.00	15,858.65	9,941.20
Yellowstone.....	391,250.00	407,067.69	412,983.27
Yosemite.....	284,000.00	292,301.57	309,085.20
Zion.....	39,800.00	45,668.60	37,841.67
National Historical Parks and Monuments.....	109,400.00	105,251.75	689.55
National Monuments.....	167,000.00	158,294.20	2,228.06
National Military Parks and Monuments.....	257,900.00	243,348.22	5,075.48
Blue Ridge Parkway.....	-----	-----	52.50
Boulder Dam recreation area.....	10,000.00	9,674.79	5.44
National Park Service.....	189,880.00	170,680.40	408.04
Public Buildings and Grounds.....	6,535,900.00	7,264,395.71	5,748.45
Public Buildings and Grounds, deficiency.....	1,150,000.00	-----	-----
Do.....	421,315.00	-----	-----
General expenses, N. P. S.....	27,000.00	26,842.13	-----
Forest protection and fire prevention.....	90,000.00	77,063.66	-----
Emergency reconstruction and fighting forest fires.....	40,000.00	74,207.19	-----
Emergency reconstruction and fighting forest fires, deficiency.....	130,000.00	-----	-----
Construction of roads and trails.....	6,500,000.00	1,886,550.55	-----
Executive mansion and grounds.....	143,098.00	141,256.43	-----
Executive mansion and grounds, deficiency.....	78,000.00	77,981.00	-----
Appomattox Court House, N. H. M.....	100,000.00	-----	-----
Historic sites and buildings survey.....	24,000.00	9,759.25	-----
Investigation and purchase of water rights.....	25,000.00	21,848.07	-----
Commission of Fine Arts.....	9,700.00	9,476.17	-----
Mount Rushmore.....	100,000.00	88,557.50	-----
Perry's Victory Memorial.....	4,000.00	2,744.25	3,239.00
P. W. projects, roads and trails, 1933-37.....	26,762,558.20	23,717,959.69	-----
P. W. projects, physical improvements, 1933-37.....	12,030,475.97	11,520,664.42	-----
P. W. land acquired for recreation demonstration projects.....	1,449,657.80	972,163.60	-----
E. C. W. (1933-37) (allotments program).....	82,250,467.66	-----	-----
W. P. A., 1935-37.....	24,274,090.89	13,638,312.00	-----
Total.....	165,843,853.52	63,187,087.85	1,398,691.66

¹ Represents expenditures only.² Available until expended.

NATIONAL PARKS TABLE 4.—Summary of Appropriations for the Administration, Protection, and Improvement of the National Parks and National Monuments, together With the Revenues Received, for the Fiscal Years 1917 ¹ to 1937, Inclusive

Year	Department	Appropriation	Revenues
1917	Interior Department..... War Department.....	\$537,366.67 247,200.00	
1918	Interior Department..... War Department.....	530,680.00 217,500.00	\$784,566.67 \$180,652.30
1919	Interior Department..... War Department.....	963,105.00 50,000.00 50,000.00	748,180.00 ² 217,330.55
1920	1,013,105.00	196,678.03
1921	907,070.76	316,877.96
1922	1,058,969.16	396,928.27
1923	1,433,220.00	432,964.89
1924	1,446,520.00	513,706.36
1925	1,892,601.00	663,886.32
1926	3,027,657.00	670,920.98
1927	3,258,409.00	826,454.17
1928	3,698,920.00	703,849.60
1929	4,889,685.00	808,255.81
1930	4,754,015.00	849,272.95
1931	7,813,817.18	1,015,740.56
1932	12,113,435.00	940,364.79
1933	12,831,250.00	820,654.19
1934	10,640,620.00	628,182.06
1935	53,402,249.00	
1936	10,983,089.00	731,831.80
1937	12,461,513.00	907,189.96
	16,686,090.00	1,136,533.68
	18,190,490.00	1,398,691.66

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.

² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

NATIONAL PARKS TABLE 5.—Statement of Appropriations and Authorizations for Road and Trail Work in the National Parks and National Monuments

Appropriation acts	Fiscal year	Cash appropriation	Authority to enter into contractual obligations	Total program by fiscal year
Act Dec. 5, 1924; 43 Stat. 686.....	1925	¹ \$1,000,000	.....	\$1,000,000
Act Mar. 3, 1925; 43 Stat. 1179.....	1926	1,500,000	² \$1,000,000	2,500,000
Act May 10, 1926; 44 Stat. 491.....	1927	2,000,000	² 1,500,000	2,500,000
Act Jan. 12, 1927; 44 Stat. 966.....	1928	2,000,000	² 2,500,000	
First Deficiency Act, Dec. 22, 1927; 45 Stat. 19.....		1,000,000		3,000,000
Act Mar. 7, 1928; 45 Stat. 237.....	1929	2,500,000	² 4,000,000	5,000,000
Act Mar. 4, 1929; 45 Stat. 1601.....	1930	5,000,000	² 2,500,000	3,500,000
Act May 14, 1930; 46 Stat. 319.....		5,000,000		
Act Dec. 20, 1930; emergency construction.....	1931	1,500,000	² 2,500,000	
Emergency construction funds transferred by the President.....		578,800		7,078,800
Act Feb. 14, 1931; 46 Stat. 1115.....	1932	5,000,000	² 2,850,000	
Second Deficiency Act 1931; Mar. 4, 1931.....		2,500,000		7,850,000
Act Apr. 22, 1932; 47 Stat. 126, 127.....	1933	4,500,000	³ 2,500,000	7,150,000
Emergency construction and relief.....		3,000,000		
Act Feb. 17, 1933; 47 Stat. 852, 853.....	1934	2,435,700		-64,300
Emergency construction.....	1935	5,000,000		5,000,000
Act May 9, 1935; Public, No. 53, 74th Cong.....	1936	7,500,000		7,500,000
Act June 22, 1936; Public, No. 741, 74th Cong.....	1937	6,500,000		6,500,000
Total appropriated.....		58,514,500		
Total program to date.....				58,514,500

¹ Of this amount \$4,290.39 was reappropriated Dec. 22, 1927 (45 Stat. 46), and \$510 on May 29, 1928 (45 Stat. 933).

² Funds appropriated in next year.

³ \$64,300 of this amount was not appropriated in 1934.

NATIONAL PARKS TABLE 6.—Forest-fire Statistics, Calendar Year 1936

Name	Classification			Point of origin				Causes of fires								Grand total			
	A ¼ acre or less	B Be- tween ¼ and 10 acres	C 10 or less	Total	Inside parks		Outside parks		Light- ning	Camp fires	Smok- ers	Debris burn- ing	Incen- diary	Lum- bering	Rail- roads		Miscel- laneous	Total man- made	
					No.	No.	No.	No.											No.
National Parks:																			
Acadia.....	No.	No.	No.	No.														No.	2
Bryce Canyon.....	2			2	1														
Carlsbad.....																			
Crater Lake.....	9	1		10	10					6	4							4	10
General Grant.....																			
Glacier.....	63	4	5	72	62	5		5	40	2	25	2					3	32	72
Grand Canyon.....	34	9		43	37	1		5	41			1	1				2	43	72
Grand Teton.....	2			2	2						2						2	2	2
Great Smoky.....	9	16	33	58	20	10		4	9	5	5	14	18	3	2		2	49	58
Hawaii.....	1			1	1						1						1	1	1
Hot Springs.....	6	9		15	11			2										15	15
Lassen.....	8	2	1	11	6			5	4		3	9	2	1				15	15
Mammoth Cave.....	46	187	53	286	156	127		1		2	36	38	209				1	286	286
Mesa Verde.....	5			5	5				5										5
Mount McKinley.....																			
Mount Rainier.....	3	1		4	4				1									3	4
Platt.....	1	5	1	7	6			1			4			1				7	7
Rocky Mountain.....	2			2	1						1							1	2
Sequoia.....	13	2	2	17	13				10		3							7	22
Shenandoah.....	6	15	11	32	21			2	9	4	7	3	14				4	28	32
Wind Cave.....			2	2														2	2
Yellowstone.....	50	9		59	58					31	6	17	1				5	28	50
Yosemite.....	37	11	2	50	48	1		1	24	8	15	1					2	26	50
Zion.....	1			1	1													1	1
Military and Historical Parks:																			
Chickamauga, Chattanooga.....		5	3	8	8						4	4						8	8
Colonial.....	1	3	3	7	2			5			6	1						7	7
Fredericksburg.....	1	1		2	2			1										2	2
Petersburg.....		3	1	4	1						2		2					4	4
Shiloh.....	2	5		7	4			1	1	1	2	2					3	7	7
Stones River.....		1	1	2	2						1		1					2	2
Vicksburg.....	6	6		12	8			4			9	1			2			12	12
Monuments:																			
Bandelier.....	1			1	1				1									1	1
Death Valley.....	1			1	1													1	1
Lava Beds.....			2	2	3						3							3	3
Pinnacles.....				1	1												1	1	1
Scott's Bluff.....		2		2	1			1			1	1						2	2
National Capital Parks.....		4		4	4						1	1					3	4	4
Total.....	311	302	120	733	502	145	19	67	178	26	171	72	247	3	4	32	555	733	733

NATIONAL PARKS TABLE 6.—Forest-fire Statistics, Calendar Year, 1936—Continued

[illegible]

[illegible]

NOTE.—C. C. C. labor valued at \$1.50 per day used in above table. Emergency allotment from F. F. F. not included in fire suppression costs: Glacier, \$296; Yellowstone, \$101 total, \$397.

COOPERATION

Park or monument	Number of fires	Man hours or days	Protection agency
		14,200 man-hours C. C. C.	Furnished by Office of Indian Affairs.
	1	10,872 man-hours C. C. C.	Furnished by U. S. Forest Service.
Glacier		9,552 man-hours C. C. C.	Furnished by Bureau of Reclamation.
	1	15 man-hours C. C. C.	Furnished to Canada.
	5	5,197 man-hours C. C. C.	Furnished to U. S. Forest Service.
		9 man-days C. C. C.	Do.
Mount Ranier	4	201 man-days C. C. C.	Furnished to Washington State Fire Association.
Platt	1	70 man-days C. C. C.	Furnished on nonreportable outside fires.
Sequoia	15	14,474 man-days C. C. C. (48 man-days E. C. W.)	Furnished to U. S. Forest Service and to State of California.

² Class B; class C.

1 Class C.

NATIONAL PARKS TABLE 7.—Buildings in the District of Columbia Maintained, Operated, and Protected by the National Park Service

Building	Location	Government-owned gross floor area	Rented net floor area
		<i>Square feet</i>	<i>Square feet</i>
Agriculture, Administration.....	The Mall at 13th St.....	307,692	
Agriculture, Annex (Economics).....	12th and C Sts. SW.....	86,000	
Agriculture, Mechanical Shops.....	13th St. and Constitution Ave. NW.....	32,058	
Agriculture (South).....	12th, 14th and C Sts. and Independence Ave. SW.....	2,056,430	
Archives.....	Constitution Ave. between 7th and 9th Sts. NW.....	496,200	
Arlington.....	Vermont Ave. and H St. NW.....	575,000	
Army Medical Museum.....	7th St. and Independence Ave. SW.....	83,938	
Atlantic ¹	928-30 F St. NW.....		38,337
Barber & Ross ¹	11th and G Sts. NW.....		30,750
Barr ¹	910 17th St. NW.....		26,262
Bureau of Fisheries.....	6th St. and Independence Ave. SW.....	39,131	
C St. NW., 2115.....		35,000	
Capitol Courts SW., 43-49.....			2,500
Carry ³	927 15th St. NW.....		8,872
Central Heating Plant.....	12th, 13th, C and D Sts. SW.....		
City Club ¹	1320 G St. NW.....		48,610
Civil Service.....	7th, 9th, F and G Sts. NW.....	246,244	
Commerce.....	Constitution Ave. between 14th and 15th.....	1,605,066	
Connecticut Ave. NW., 815.....			100,000
Connecting wing.....	Between new I. C. C. and Labor Bldgs.....	234,100	
Daily News.....	1322 New York Ave. NW.....		22,000
De Moll ³	12th and G Sts. NW.....		15,243
E Building.....	6th St. and Main Ave. SW.....	231,771	
E St. NW., 1300.....		274,323	
E St. NW., 1345 ¹			7,544
Executive Office.....	West Executive Ave.....	40,000	
F Building.....	7th St. and Constitution Ave. NW.....	266,560	
F St. NW., 918-20 ¹			1,230
F St. NW., 1723-25.....		20,369	
F St. NW., 1724.....			46,946
Fed. Home Loan Bank Board.....	101 Indiana Ave. NW.....	278,700	
Florida Ave. NE., 60.....			27,200
G St. NW., 1328 ³			4,000
G St. NW., 1712 (annex).....		8,166	
G St. NW., 1712.....			84,981
Garage (Veterans' Administration).....	Kansas Ave. and Upsbur St. NW.....		43,723
Garage.....	3d and Canal Sts. SW.....	48,000	
Garage (White House).....	1126 21st St. NW.....		90,788
Garage (Interior).....	21st St. and Virginia Ave. NW.....	36,000	
Garage.....	24th and M Sts. NW.....		48,800
General Accounting.....	Judiciary Square.....	196,554	
H St. NW., 1510.....			8,738
H St. NW., 1712 ¹			8,090
H St. NW., 1825.....			199,344
Hurley-Wright.....	18th St. and Pennsylvania Ave. NW.....		95,091
I St. NW., 1004.....			489
I St. NW., 1624.....			13,000
Independence Ave. SW., 816.....		4,239	
Independence Ave. SW., 908.....		17,408	
Interior.....	C, E, 18th and 19th Sts. NW.....	1,308,300	
Interior (North).....	E, F, 18th and 19th Sts. NW.....	726,535	
Internal Revenue.....	Constitution Ave. between 10th and 12th Sts. NW.....	1,231,000	
Interstate Commerce.....	12th St. and Constitution Ave. NW.....	456,700	
Investment ³	15th and K Sts. NW.....		18,620
Justice.....	Constitution Ave. between 9th and 10th Sts. NW.....	1,237,000	
K St. NW., 1415 ¹			5,374
K St. NW., 1435.....			15,000
K St. NW., 1437.....			20,000
K St. NW., 1518.....			10,632
Kalorama Rd. NW., 1700.....			28,000
Labor.....	14th St. and Constitution Ave. NW.....	447,000	
LaSalle ¹	1028 Connecticut Ave. NW.....		49,416
Lemon.....	1729 New York Ave. NW.....		25,975
Lenox ³	1523 L St. NW.....		22,000
Lincoln ¹	514 10th St. NW.....		13,938
M St. NW., 2214-16.....			9,317
McCrory ¹	824-26 7th St. NW.....		10,683

¹ Either maintenance, operation, or protection or all three classes of service provided only for a portion of the building. All other buildings except 1001 Vermont Ave., NW., maintained, operated, or protected in their entirety.

² Gross area.

³ Protection service only is provided.

NATIONAL PARKS TABLE 7.—Buildings in the District of Columbia Maintained, Operated, and Protected by the National Park Service—Continued

Building	Location	Government-owned gross floor area	Rented net floor area
		<i>Square feet</i>	<i>Square feet</i>
McKinley Park buildings.....	19 buildings, American University Park.....		65,633
Massachusetts Ave. NW., 2000			² 24,309
Massachusetts Ave. NW., 2020			19,242
Mather ³	916 G St. NW.		12,323
Moses ¹	11th and F Sts. NW.		97,378
Munitions	Constitution Ave. between 19th and 21st Sts. NW.	851,940	
National Theater ³	1325 E St. NW.		16,000
Navy.....	Constitution Ave. between 17th and 19th Sts. NW.	949,182	
Ouray ¹	801 G St. NW.		17,557
Pennsylvania Ave. NW., 1778			¹ 207,550
Post Office (new)	Pennsylvania Ave. between 12th and 13th Sts. NW.	840,000	
Post Office (old)	12th St. and Pennsylvania Ave. NW.	377,951	
Potomac Park Apartment	306 21st St. NW.	108,000	
Procurement Division	8th, 9th, C and D Sts. SW.	886,750	
Public Health	Constitution Ave. between 19th and 20th Sts. NW.	79,931	
Rizik ³	1737 L St. NW.		15,983
South Capitol St., 401			55,080
Standard Oil ³			36,762
State Department	261 Constitution Ave. NW.		
Storage Building & Vault	17th and Pennsylvania Ave. NW.	440,250	
Tariff Commission	Missouri Ave. between 4 ¹ / ₂ and 6th Sts. NW.	5,949	
Tempo No. 2	7th, 8th, E and F Sts. NW.	140,118	
U Street NW., 1331-41	19th and D Sts. NW.	78,240	
Vermont Ave. NW., 1001 ³			² 85,725
Vermont Ave. NW., 1020 ³			¹ 119,000
Vermont Ave. NW., 1025			3,693
Vermont Court NW., 1126			54,696
Walker-Johnson			13,631
Wilkins	1734 New York Ave. NW.		¹ 110,312
Willard	1514 H St. NW.	54,000	
Winder	513-15 14th St. NW.		26,543
7th St. NW., 425	17th and F Sts. NW.	63,880	
8th St. SW., 215			7,000
10th St. NW., 1918		5,970	
12th St. SW., 224			48,799
14th St. NW., 509 ¹		13,204	
14th St. NW., 1840			6,540
15th St. NW., 821			30,500
18th St. NW., 718			10,446
19th St. NW., 1220			¹ 41,330
21st St. NW., 1503			² 44,100
26th St. NW., 501-13 ³			² 5,500
			22,200
Total.....		17,570,899	2,399,325

NATIONAL PARKS TABLE 8.—Buildings Outside the District of Columbia Maintained, Operated, and Protected by the National Park Service

Building	Location	Government-owned gross floor area
		<i>Square feet</i>
Broadway, 45.....	New York City, N. Y.	142,500
Courthouse.....	Aiken, S. C.	17,474
Do.....	New York City, N. Y.	655,787
Do.....	Parkersburg, W. Va.	34,900
Do.....	Santa Fe, N. Mex.	47,600
Federal Office	Des Moines, Iowa	64,200
Do.....	Galveston, Tex.	15,000
Immigration Station	Baltimore, Md.	98,000
Museum	Morristown, N. J.	¹ 19,000
Old Customhouse	Denver, Colo.	72,300
Do.....	Salem, Mass.	¹ 11,520
Old Post Office	Sacramento, Calif.	47,600
Sub-Treasury	New York City, N. Y.	72,000
Total.....		1,298,081

¹ Approximate gross floor areas.

NATIONAL PARKS TABLE 9.—Memorials Maintained, Operated, and Protected by the National Park Service

Memorial	Location	Gross floor area
		<i>Square feet</i>
Columbus Fountain.....	Union Station Plaza.....	
District of Columbia War Memorial.....	West Potomac Park.....	
Lee Mansion.....	Arlington, Va.....	7, 252
Lincoln House.....	516 10th St. NW.....	4, 234
Lincoln Memorial.....	West Potomac Park.....	
Lincoln Museum.....	511 10th St., NW.....	30, 510
Washington Monument.....	The Mall between 14th and 17th Sts.....	
Total.....		41, 996

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937

Item	Total work accomplished July 1, 1936-June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Foot bridges.....	Number.....	23	122	145	22
Horse bridges.....	Number.....	18	9	27	8
Vehicle bridges.....	Number.....	11	103	114	28
Buildings, barns.....	Number.....	2	5	7	8
Buildings, bath houses.....	Number.....	3	20	23	
Buildings, cabins, overnight.....	Number.....	10	286	296	
Combination buildings.....	Number.....		51	51	
Buildings, contact station.....	Number.....	11	14	25	4
Dwellings.....	Number.....	55	50	105	343
Equipment and supply storage houses.....	Number.....	32	117	149	20
Garages.....	Number.....	22	143	165	5
Latrines and toilets.....	Number.....	99	216	315	86
Lodges.....	Number.....		20	20	7
Lookout houses.....	Number.....		14	14	5
Lookout towers.....	Number.....	10	4	14	4
Museums.....	Number.....	3	1	4	8
Shelters, trailside.....	Number.....	3	98	101	
Shelters, other.....	Number.....		94	94	6
Other buildings.....	Number.....	34	205	239	65
Cribbing, including filling.....	Cubic yard.....	2, 875	19, 087	21, 962	5, 081
Dams, impounding and large diversion.....	Number.....	5	32	37	3
Dams, concrete for.....	Cubic yard.....	220	32, 718	32, 938	
Dams, earth fill for.....	Cubic yard.....	13, 690	598, 794	612, 484	150
Dams, rock fill for.....	Cubic yard.....		4, 662	4, 662	
Dams, earth excavation for.....	Cubic yard.....		325, 144	325, 144	1, 404
Dams, rock excavation for.....	Cubic yard.....	30	20, 215	20, 245	
Dams, masonry for.....	Cubic yard.....	130	11, 286	11, 416	
Dams, riprap for.....	Square yard.....	48	38, 062	38, 110	30
Dams, steel for.....	Pound.....		576, 258	576, 258	
Fences.....	Rod.....	26, 900. 4	65, 317	92, 217. 4	76, 175
Guard rails.....	Rod.....	2, 647	23, 423. 3	2, 607. 03	1, 573
Levees, dykes, and jetties.....	Cubic yard.....	8, 000	185, 923	193, 923	
Power lines.....	Mile.....	6. 3	50. 7	57. 0	20. 9
Sewage and waste disposal.....	Square yard.....		55, 148	55, 148	
Sewage and waste disposal tanks and pools.....	Number.....	21	171	192	2
Incinerators.....	Number.....	9	42	51	
Sewer lines.....	Linear foot.....	37, 060	106, 554	143, 614	6, 531
Other sewage disposal.....	Man-days.....	5, 429	4, 590	10, 019	596
Telephone lines.....	Mile.....	124. 5	109	233. 5	1, 973. 1
Drinking fountains.....	Number.....	18	162	180	
Water supply, open ditches.....	Linear foot.....	1, 200	4, 739	5, 930	
Water supply, pipe or tile lines.....	Linear foot.....	105, 055	345, 267	450, 322	18, 734
Springs, water holes.....	Number.....	30	105	135	
Water storage facilities (omit last 900).....	Gallon.....		632. 3	632. 3	
Weils.....	Number.....	13	110	123	2

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937—Continued

Item	Total work accomplished July 1, 1936-June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Other water supply.....	Man-days.....	2, 718	7, 335	10, 053	2, 745
Camp stoves, etc.....	Number.....	429	2, 268	2, 697	72
Cattle guards.....	Number.....	-----	31	31	1
Corrals.....	Number.....	9	6	15	2
Portals.....	Number.....	6	34	40	-----
Seats.....	Number.....	280	5, 993	6, 273	77
Signs.....	Number.....	6, 670	4, 521	11, 191	2, 418
Stone walls.....	Rod.....	1, 578. 5	3, 986. 8	5, 565. 3	70
Table and bench combinations.....	Number.....	684	4, 394	5, 078	22
Tool boxes.....	Number.....	5	105	110	-----
Miscellaneous structural improvements.....	Number.....	203	4, 357	4, 560	3
Radio stations.....	Number.....	3	-----	3	43
Airplane landing fields.....	Number.....	-----	1	1	-----
Truck trails.....	Mile.....	98. 8	210. 7	309. 5	955. 4
Minor roads.....	Mile.....	99. 3	-----	99. 3	1, 274. 3
Highway maintenance.....	Mile.....	-----	-----	-----	1, 731. 4
Park roads.....	Mile.....	-----	344. 3	344. 3	-----
Foot trails.....	Mile.....	93. 8	301	394. 8	305. 3
Horse trails.....	Mile.....	119. 3	153. 6	272. 9	1, 926. 8
Stream and lake bank protection.....	Square yard.....	23, 194	235, 797	258, 991	-----
Erosion treatment of gullies; area treated.....	Acre.....	3, 758. 7	2, 259. 2	6, 017. 9	307. 2
Gullies, bank sloping.....	Square yard.....	409, 680	236, 589	646, 269	192, 248
Gullies, permanent check dams.....	Number.....	345	2, 514	2, 859	-----
Gullies, temporary check dams.....	Number.....	791	1, 946	2, 737	1, 526
Gullies, seeding and sodding.....	Square yard.....	193, 542	494, 116	687, 658	170, 793
Gullies, tree planting.....	Square yard.....	220, 972	83, 500	304, 472	-----
Gullies, diversion ditches.....	Linear feet.....	108, 209	22, 582	130, 791	4, 680
Terracing.....	Mile.....	1	5. 1	6. 1	-----
Sheet erosion planting.....	Acre.....	-----	1, 005	1, 005	-----
Limestone quarrying.....	Ton.....	-----	700	700	-----
Miscellaneous erosion control.....	Man-days.....	-----	65, 491	65, 491	-----
Clearing and cleaning, channels.....	Square yard.....	-----	86, 820	86, 820	-----
Clearing and cleaning, reservoir sites.....	Acre.....	60	284. 7	344. 7	-----
Excavation, canals, channels, ditches, earth.....	Cubic yard.....	24, 242	1, 082, 105	1, 106, 347	-----
Excavation, canals, channels, ditches, rock.....	Cubic yard.....	370	45, 773	46, 143	-----
Pipe lines and conduits.....	Linear feet.....	6, 104	500	6, 604	-----
Riprap or paving, rock or concrete.....	Square yard.....	5, 281	42, 188	47, 469	-----
Riprap or paving, brush or willows.....	Square yard.....	1, 338	-----	1, 388	-----
Water control structures, concrete or or masonry for.....	Cubic yard.....	725	3, 681	4, 406	-----
Water control structures, wood for.....	Ft. b. m.....	5, 504	42, 450	47, 954	3, 831
Water control structures, other than dams, number.....	Number.....	62	185	247	11
Field planting or seeding (trees).....	Acre.....	4, 259. 7	6, 713. 6	10, 973. 3	5, 366. 7
Forest stand improvement.....	Acre.....	64	1, 203	1, 267	-----
Nurseries.....	Man-day.....	16, 694	39, 477	56, 171	2, 583
Tree seed collection, conifers.....	Bushel.....	177	102	279	-----
Tree seed collection, hardwoods.....	Pound.....	4, 269	14, 510	18, 779	-----
Fighting forest fires.....	Man-day.....	34, 281	127, 749	162, 030	-----
Fire breaks.....	Mile.....	12. 8	331. 2	344. 0	37. 9
Fire hazard reduction, roadside.....	Mile.....	146. 9	153. 7	300. 6	-----
Fire hazard reduction, trail-side.....	Mile.....	51. 5	162. 5	214. 0	-----
Other fire hazard reduction.....	Acre.....	7, 146. 2	19, 601. 3	26, 747. 5	-----
Fire presuppression.....	Man-day.....	39, 814	51, 190	91, 004	-----
Fire prevention.....	Man-day.....	1, 355	2, 758	4, 113	-----
Tree and plant disease control.....	Acre.....	5, 269	33, 338. 6	38, 607. 6	-----
Tree insect pest control.....	Acre.....	16, 530. 9	61, 497	78, 027. 9	4, 314
Beach improvement.....	Acre.....	56	230. 1	286. 1	1. 3
Fine grading, road slopes.....	Square yard.....	1, 194, 093	3, 260, 906	4, 454, 999	2, 521
Lake or pond site clearing.....	Acre.....	1, 021	2, 144. 2	3, 165. 2	-----
Landscaping, undifferentiated.....	Acre.....	11, 151. 6	3, 883	15, 034. 6	486. 6
Moving and planting trees and shrubs.....	Number.....	522, 716	1, 995, 402	2, 518, 118	488, 548
Obliteration, roads.....	Mile.....	44. 1	72. 5	116. 6	-----
Obliteration, trails.....	Mile.....	3	11. 7	14. 7	-----
Obliteration, borrow pits.....	Man-day.....	15, 206	65, 428	80, 634	-----
Parking areas and overlooks.....	Square yard.....	86, 370	774, 578	860, 948	2, 000

NATIONAL PARKS TABLE 10.—Statement Showing Work Accomplished at Civilian Conservation Corps Camps Under the Jurisdiction of the National Park Service July 1, 1936 to June 30, 1937—Continued

Item	Total work accomplished July 1, 1936-June 30, 1937				
	New construction				Maintenance
	Unit	National parks and monuments	State parks	Combined total national parks and State parks	National parks and monuments
Public camp ground development.....	Acre.....	158.7	204.5	363.2	460.2
Public picnic ground development.....	Acre.....	63.9	364.3	428.2	406.7
Razing undesirable structures.....	Number.....	776	2,606	2,782	-----
Seed collection, flowers, grasses, shrubs.....	Pound.....	2,599	4,367	6,966	-----
Seeding or sodding.....	Acre.....	519.1	1,993.5	2,512.6	5,126.7
Soil preparation (fertilizing, etc.).....	Acre.....	393	1,109	1,502	2
Vista or other selective cutting.....	Acre.....	230.7	2,086.6	2,317.3	-----
Walks; concrete, gravel, cinder, etc.....	Linear foot.....	21,342	52,468	73,810	7,306
Fish rearing ponds.....	Number.....	9	29	38	25
Food and cover planting.....	Acre.....	15	7,414.6	7,429.6	1,725
Lake and pond development.....	Man-day.....	81	28,345	28,426	-----
Stocking fish.....	Number.....	1,196,820	156,237	1,353,057	-----
Stream development.....	Mile.....	11.1	12.8	23.9	-----
Other wildlife activity.....	Man-day.....	8,548	6,666	15,214	-----
Emergency wildlife feeding.....	Man-day.....	-----	116	116	-----
Education, guide and contact station work.....	Man-day.....	51,700	32,610	90,310	-----
Searching for or rescuing persons.....	Man-day.....	1,608	4,395	6,003	-----
Other emergency work.....	Man-day.....	9,271	132,024	141,295	-----
Eradication of poisonous weeds or exotic plants.....	Acre.....	5,009	1,633.4	6,642.4	-----
Experimental plots.....	Number.....	12	8	20	1
Insect pest control.....	Acre.....	-----	600	600	-----
Type and topographic maps.....	Man-day.....	3,160	5,444	8,604	-----
Relief maps and models.....	Man-day.....	2,193	510	2,733	-----
Marking boundaries.....	Mile.....	135.5	134.1	270.6	-----
Mosquito control.....	Acre.....	40	5,391.2	5,431.2	-----
Preparation and transportation of materials.....	Man-day.....	83,961	562,396	646,360	-----
Archaeological, reconnaissance and investigation.....	Man-day.....	13,854	20,525	34,379	-----
Reconnaissance and investigation, other.....	Man-day.....	2,417	21,620	24,037	-----
Restoration of historic structures.....	Number.....	934	58	992	-----
Rodent control.....	Acre.....	-----	2,050	2,050	-----
Grade line surveys.....	Mile.....	120.1	488.7	608.8	-----
Ground water surveys.....	Acre.....	-----	410	410	-----
Lineal surveys.....	Mile.....	701.5	1,683.9	2,385.4	-----
Topographic surveys.....	Acre.....	5,208.4	265,341.6	270,550	-----
Type surveys.....	Acre.....	715	50,716.4	51,425.4	-----
Other surveys.....	Man-day.....	4,734	9,092	13,826	-----
Tree preservation.....	Man-day.....	21,140	27,605	48,745	-----
Unclassifiable.....	Man-day.....	5,898	1,092	6,990	-----

GENERAL LAND OFFICE

Fred W. Johnson, *Commissioner*

SINCE the passage of the act of June 28, 1934 (48 Stat. 1269), known as the Taylor Grazing Act, as amended by the act of June 26, 1936 (49 Stat. 1976), and the withdrawal of the public lands from entry by Executive orders of November 26, 1934, and February 5, 1935, nos. 6910 and 6964, respectively, the work of the General Land Office has undergone a very decided change. Conservation rather than disposals is the dominant note in the administration of the public lands under existing laws. With some exceptions, which hereinafter will be noted under the heading "Present Status of Public Lands in Connection With General Withdrawals", the public lands may now be disposed of only after appropriate classifications.

While formerly the public lands were open range, subject to unrestricted grazing use, more than 110,000,000 acres of such lands have been included within grazing districts established under the above-mentioned acts, and grazing leases have been issued under the supervision of this Office regulating the grazing use of approximately 5,643,000 acres outside of such grazing districts. Such regulation will tend to prevent overgrazing of the lands and consequent soil deterioration.

In order to secure the more economical administration of the remaining lands both within and outside of grazing districts, the Taylor Grazing Act provides for exchanges of lands with the States and with individuals. The States and individuals making the exchanges will also benefit through the consolidation of their respective holdings. Applications for such exchanges were pending at the close of the year involving more than 2,375,000 acres of public land. The present status of such applications will be given under appropriate titles.

In connection with the oil and gas resources, it may be noted that on June 30, 1937, there were pending 4,237 applications for oil and gas leases under the act of August 21, 1935 (49 Stat. 674), amending the mineral leasing act of February 25, 1920 (41 Stat. 437), in the

interest of conservation. Further reference to these and other applications under the mineral leasing acts will be made under the title "Mineral Leases and Mining Claims."

The area included in original entries, selections, and filings made during the year was 124,530 acres, as against 425,834 acres for the preceding year. For the most part, such entries, selections, and filings were based on applications filed or rights initiated prior to the withdrawal of the public lands from entry by Executive orders of November 26, 1934, no. 6910, and February 5, 1935, no. 6964. However, 155 reclamation homestead entries were made for 17,463 acres of public lands and 24 forest homestead entries were made for 1,655 acres, the said Executive orders having been construed by the Department not to prohibit the allowance of such entries. In addition, 26 reclamation homestead entries were made for 3,561 acres of ceded Indian land, which was subject to such disposition.

The area embraced in final entries, selections, and filings made during the year was 2,026,203 acres, an increase of 88,677 acres over the area included in such entries during the preceding year.

Altogether, 6,279 patents were issued for 2,114,142 acres, while during the preceding year 8,238 patents were issued for 2,216,684 acres. Minerals in some form were reserved in 69 percent of all land patented. Under State grants, 74,420 acres were certified to States as indemnity school selections and as quantity selections under grants for specific purposes.

The area which, on June 30, 1937, was embraced in unperfected entries upon which final proof of compliance with the law was not due or had not been presented, was 9,555,102 acres.

There were furnished during the year 41,364 certified and uncertified copies of entry papers, plats, field notes, patents, etc., for which there were received amounts aggregating \$11,961.70. In addition, there were furnished for official use by this and other departments and agencies, 53,900 copies of such items. The total number of copies furnished shows a decrease of 1,650, or about 1½ percent under the preceding year; the receipts from such copies show an increase of \$1,134.95, or more than 10 percent over the preceding year.

Reports were submitted on 128 Senate and House bills, and necessary orders and instructions have been prepared or are in course of preparation in connection with 24 bills, public and private, affecting the public lands, which are enacted into law. Reports were made on five enrolled bills.

Twelve cases have been found in which, through inadvertence, patents have been issued without mineral reservations required by law and more than 6 years have elapsed since the patents were issued. In all of such cases field investigations have been requested by this Office with a view either to obtaining appropriate reconveyances from

the patentees or, if not obtainable, for the purpose of securing data needed as a basis for civil proceedings in the courts, looking to the recovery of the erroneously patented mineral deposits.

Three hundred and eleven letters were written in connection with pending and proposed suits, application of agents or attorneys for admission to practice before the Department, and charges preferred against United States Commissioners, registers, attorneys, and others.

Twenty civil suits were recommended to cancel leases for oil and gas, coal, potash, borax, and sodium: to cancel patents issued through fraud; and in connection with timber trespass. Eighteen cases were reported won and six lost. As a result of such suits, judgments and compromises have been reported amounting to \$11,629.11, of which \$11,353.45 was paid, and 240.63 acres were recovered.

Seventy-one applications of agents and attorneys for admission to practice before the Department were considered, of which 69 were approved and 2 rejected.

The number of letters and reports received for consideration or answer from all sources during the year was 135,106, and 68,432 letters and decisions were written. The latter figure does not include letters prepared for signature in the Department.

There were decided on principles of equity and referred to the Board of Equitable Adjudication and confirmed 1,652 homestead entries of public lands, 35 homestead entries of ceded Indian lands, 25 reclamation homesteads, and 37 desert-land entries.

Descriptions of lands were furnished for orders establishing grazing districts, and diagrams to accompany the orders, showing the exterior boundaries of each district and other pertinent data, were prepared. Estimates were submitted giving the area of the unappropriated, unreserved public lands in each established grazing district.

In land exchanges made for the benefit of other bureaus, this Office examined abstracts of title covering about 150,000 acres.

On June 30, 1937, there were 252 employees of the General Land Office in Washington, 72 in the district land offices, 136 in the field surveying service, and 3 in the Chippewa logging service.

EMERGENCY CONSERVATION WORK

The work of controlling the coal fires that for years have been destroying the irreplaceable federally owned coal beds in the vicinity of Little Thunder Basin, Wyo., was resumed on May 9 and continued to October 15, 1936, from two C. C. C. camps located at Gillette, Wyo., and operated under the jurisdiction of the General Land Office.

The report for the year again shows that not a single lost-time accident has resulted to any enrollee notwithstanding the fact that the work is perhaps the most hazardous carried on by any C. C. C. camp.

During the season work was conducted on 14 different projects, involving 11 separate and distinct underground coal fires, 1 emergency forest fire, 1 emergency prairie fire, and a miscellaneous undertaking.

PRESENT STATUS OF PUBLIC LANDS IN CONNECTION WITH GENERAL WITHDRAWALS

General withdrawals.—By Executive order of November 26, 1934, no. 6910, issued under authority of the act of June 25, 1910 (36 Stat. 847), as amended by the act of August 24, 1912 (37 Stat. 497), the vacant, unreserved, and unappropriated public lands in the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, and Wyoming were temporarily withdrawn from settlement, location, sale, or entry, subject to existing valid rights. This order was amended by Executive order of May 20, 1935, no. 7048, so as to make it applicable to all lands within the States mentioned upon the cancelation or release of prior entries, selections, or claims, or upon the revocation of prior withdrawals, unless expressly otherwise provided in the order of revocation, and so as to authorize the Secretary of the Interior, in his discretion, to accept title to land offered in exchange under the provisions of section 8 of the Taylor Grazing Act. The order of November 26, 1934, was further amended by Executive order of November 26, 1935, no. 7235, so as to permit sales under section 14 and the issuance of leases under section 15 of the Taylor Grazing Act, and so as not to debar the recognition or allowance of bona fide nonmetalliferous mining claims. The order of November 26, 1934, was further amended by Executive order of January 14, 1936, no. 7274, so as to exclude from the operation thereof all lands which were then or might thereafter be included within grazing districts established pursuant to the provisions of the Taylor Grazing Act, so long as such lands remain a part of any such grazing district.

By Executive Order No. 6964, of February 5, 1935, issued under authority of the said act of June 25, 1910, as amended, all public lands in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, Washington, and Wisconsin were temporarily withdrawn from settlement, location, sale, or entry subject to valid existing rights. This order was amended by Executive order of May 6, 1936, no. 7363, so as to permit exchanges under section 8, sales under section 14, and the issuance of leases under section 15 of the Taylor Grazing Act.

Classification for entry under any law authorized.—Section 7 of the Taylor Grazing Act of June 28, 1934 (48 Stat. 1269), as amended by section 2 of the act of June 26, 1936 (49 Stat. 1976), authorizes the Secretary of the Interior, in his discretion, to examine, classify, and open to appropriate entry any lands withdrawn by the Executive

order of November 26, 1934, as amended, or the Executive order of February 5, 1935, or any lands within a grazing district, which are more valuable or suitable for the production of agricultural crops than for the production of native grasses and forage crops, or more valuable or suitable for any other use than for the use provided for under said act, or proper for acquisition in satisfaction of any outstanding lien, exchange, or scrip rights or land grant, except that homestead entries may not be allowed for tracts exceeding 320 acres in area. Revised instructions governing the filing of applications for entry, selection, or location under said section 7 were approved June 29, 1937, Circular No. 1353.

The said section 7, as amended, further provides that locations and entries under the mining laws, including the act of February 25, 1920 (41 Stat. 437), as amended, may be made upon such withdrawn and reserved areas without regard to classification and without restrictions or limitation by any provision of the act.

UNAPPROPRIATED PUBLIC LANDS

The area of the unappropriated and unreserved public lands as of June 30, 1934, the date on which a computation was last made, was approximately 165,695,479 acres, not including Alaska, and not including small areas remaining undisposed of in the States of Alabama, Arkansas, Florida, Kansas, Louisiana, Michigan, Minnesota, Mississippi, Nebraska, Oklahoma, and Wisconsin. Of such areas 119,341,782 acres were surveyed, and 46,353,697 acres were unsurveyed. The area of the unappropriated and unreserved public lands in Alaska was approximately 346,174,242 acres, of which 2,044,421 acres were surveyed.

In computing the areas which were vacant and unreserved on the date mentioned, lands in pending, unallowed applications were considered as appropriated; but lands in applications for oil and gas prospecting permits, or in permits granted, or in applications for coal, phosphate, sodium, and/or sulphur, oil shale, or potash permits or leases, or in permits or leases granted, were considered as unappropriated. In view of the fact that the lands affected by the oil-shale order of withdrawal of April 15, 1930, or in designated geological structures of producing oil or gas fields, or in approved oil and gas leases, were then subject to disposition under the stock-raising homestead act, such lands were treated as unappropriated.

The areas which were included in original entries, selections, filings, etc., during the fiscal years 1935, 1936, and 1937, were 2,281,253 acres in the public-land States, and 28,189 acres in Alaska, a total of 2,309,442 acres. No computation has been made showing the areas restored to the public domain during said years through the rejection of applications or the cancelation of entries.

The area of the unappropriated and unreserved public lands in grazing districts established under the provisions of the Taylor Grazing Act was about 110,152,000 acres as of June 30, 1937.

LANDS PATENTED WITH MINERAL RESERVATIONS

The following table shows the areas patented during the year and the total areas heretofore so patented in which minerals in some form have been reserved to the United States:

	Fiscal year	Total reserved
	<i>Acres</i>	<i>Acres</i>
Stockraising act, all minerals reserved.....	1,419,778	29,113,272
Other acts:		
All mineral reserved.....	3,782	444,192
Coal only reserved.....	9,941	10,785,468
Some named mineral reserved.....	26,035	1,758,386
Total.....	1,459,536	42,101,318

CADASTRAL ENGINEERING SERVICE

The Cadastral Engineering Service of the General Land Office is charged with the execution of cadastral surveys and resurveys of the public lands of the United States proper and Alaska, the supervision of mineral surveys for patent, and the preparation of the technical and legal records of the work performed.

During the year field projects were executed in 22 States and the Territory of Alaska under 227 separate groups, 69 of which in 14 States were of resurveys. In these areas, 37,662 linear miles, embracing 6,756,225 acres, were surveyed and resurveyed, exclusive of engineering investigations and many types of miscellaneous and special projects not measurable on a quantity basis.

Office work in all branches was maintained on a current basis. Two hundred and eighty-nine township base plats, 154 color overlay sheets, 27 supplemental diagrams, 45 amended and segregation plats, and 101 special plats of miscellaneous surveys were constructed, the field notes in connection therewith being prepared in final form for the permanent record. In addition, 132 mineral surveys, embracing 543 locations, were examined, platted, and approved.

Requests by other Federal agencies for surveys and resurveys to meet the requirements of administration, conservation, and rehabilitation of the National estate, continued in increasing number and geographic scope. Such applicants included the Forest Service, Division of Grazing Control, Bureau of Reclamation, National Park Service, Geological Survey, Office of Indian Affairs, and the Soil Conservation Service.

Accepted surveys and resurveys.—There were accepted and placed on file plats representing 966,057 acres of original surveys of public

lands, and in addition 720,777 acres of lands resurveyed, comprising an aggregate area of 1,686,834 acres.

Maps, plats, and diagrams.—The wall map of the United States has been revised to show changes since the publication of the 1934 edition. The 1936 edition has been printed and delivered.

A new map of New Mexico has been issued, and a new map of Utah is in the hands of the contractor for printing.

A revised copy of the large United States map, showing the railroad grants, is being prepared for exhibit purposes in the new Interior museum.

Three hundred and thirty-nine miscellaneous maps, plats, diagrams, and tracings have been prepared.

Photolithographic copies, etc.—There were sold 7,595 photolithographic copies of township plats, for which \$3,824.50 was received; and 10,749 copies were furnished other Bureaus for official use. There were 595 maps mounted and distributed for official use, and appropriate distribution was made of 3,143 map publications and 95,453 circulars.

RECEIPTS AND EXPENDITURES

The total cash receipts from sales, leases, and other disposals of public lands (including receipts from copies of records, sales of Government property, etc.) were \$7,333,915.89 and from sales of Indian lands \$65,924.05, an aggregate of \$7,399,839.94, all of which was deposited in the Treasury. The total expenditure from appropriations made for the conduct of the Office was \$1,503,010.23. The excess of receipts over expenditures was \$5,896,829.71. The receipts were the largest in any year since 1927, exceeding last year's receipts by \$2,205,540.32.

Receipts under mineral leasing acts.—Receipts from bonuses, royalties, and rentals under laws providing for the leasing rights on the public domain (including royalties and rentals on potash deposits and royalties on coal leases in Alaska) aggregated \$5,773,681.89, of which \$5,622,366.18 was received under the act of February 25, 1920 (41 Stat. 437). The largest receipts under this act were from lands in California, the amount being \$3,107,987.77. Wyoming was second, \$1,503,743.29. Receipts from other States follow: New Mexico, \$521,311.34; Colorado, \$144,813.94; Utah, \$139,350.05; Montana, \$106,317.25; Louisiana, \$64,667.53; North Dakota, \$22,823.42; Alabama, \$7,586.40; Idaho, \$3,137.25; South Dakota, \$427.31; Nevada, \$160; Kansas, \$40; and Arizona, 63 cents. Under the provisions of the Mineral Leasing Act cited, each State receives 37½ percent of the receipts thereunder from the public lands within its borders, the reclamation fund receives 52½ percent, and the other 10 percent remains in the Treasury of the United States as miscellaneous receipts.

Receipts under the Taylor Grazing Act.—The amounts received as fees on grazing licenses, by grazing districts, and by States, and the receipts for fees and rentals under section 15 of the act, are as follows:

	Fees on licenses from grazing districts		Fees and rentals under sec. 15	State totals
	District	Amount		
Arizona.....	1	\$15,317.95		
	2	4,511.34		
	4	6,462.75		
		26,292.04	\$12,637.44	\$38,929.48
California.....	1	4,437.04		
	2	13,101.21		
		17,538.25	2,637.09	20,175.34
Colorado.....	1	17,854.65		
	2	3,002.85		
	3	13,056.83		
	4	7,741.83		
	6	8,157.70		
		49,813.86	1,748.36	51,562.22
Idaho.....	1	20,871.70	2,600.27	23,471.97
Montana.....	4	764.31		
	5	11.00		
		775.31	* 10,846.51	11,621.82
Nevada.....	1	30,375.75		
	2	21,140.75		
	3	35.00		
	5	141.90		
		51,693.40		51,693.40
New Mexico.....	3	12,215.93		
	4	12,044.99		
	5	4,101.06		
	6	19,780.56		
		48,142.54	3,801.70	51,944.24
Oregon.....	1	2,325.80		
	2	15,842.73		
	3	16,646.14		
	4	13,902.66		
	5	5,163.96		
	6	5,495.90		
		59,377.19	5,053.13	64,430.32
South Dakota.....			113.01	113.01
Utah.....	1	7,307.34		
	2	22,345.53		
	3	32,877.97		
	4	13,517.82		
	5	15,960.66		
	6	18,308.89		
	7	16,536.12		
	8	14,618.25		141,472.58
		141,472.58		
Washington.....			1,849.41	1,849.41
Wyoming.....	1	19,548.91		
	2	470.90		
	3	3,760.19		
		23,780.00	48,242.65	72,022.65
Grand total.....		439,756.87	89,529.57	529,286.44

Distribution of receipts.—Receipts from all sources, aggregating \$7,399,839.94, as shown above, are distributed under the law approximately as follows: Reclamation fund, \$2,947,045.09; for range improvements in grazing districts, \$110,359.92; to public-land States and certain counties within such States, \$2,919,241.05; general fund, \$1,357,269.83; and to various Indian tribes, \$65,924.05.

Under the provisions of the Taylor Grazing Act the States within which the lands are situated receive 50 percent of the receipts, and 25 percent thereof when appropriated by Congress may be expended for construction, purchase, and maintenance of range improvements within the grazing districts from which the receipts came.

Five percent of the net proceeds from cash sales of public lands is paid to the public-land States within which such sales were made, and the balance of such receipts from States named in the Reclamation Act are credited to the reclamation fund; the reclamation fund and the States involved receive (on the percentages shown above) 90 percent of the receipts under the Mineral Leasing Act and of receipts from potash deposits leased under the act of February 7, 1927; receipts from sales of reclamation town sites and camp sites and from royalties and rentals from potash deposits leased under the act of October 2, 1917, are credited to the reclamation fund; all of the receipts from proceeds of land and timber in the forfeited Oregon and California railroad grant will be paid to certain counties in Oregon in lieu of taxes; 25 percent of the proceeds of land and timber in the forfeited Coos Bay wagon road grant will be paid to Coos County; the receipts from Indian lands (except 37½ percent of royalties from Red River oil lands, payable to the State of Oklahoma in lieu of taxes) are deposited in the Treasury to the credit of the various Indian tribes. All other moneys are deposited in the Treasury to the credit of the general fund.

The following table shows in detail the distribution of the receipts, insofar as is possible before final settlement of all accounts by the General Accounting Office.

Source of receipt	Distribution in the Treasury			
	General fund	Reclamation and range improvement	State and county fund	Total
Sale of public lands.....	\$20,258.63	\$50,983.15	\$2,968.40	\$74,210.18
Fees and commissions.....	26,701.30	94,271.90		120,973.20
Receipts from mineral leases.....	981,935.69	2,722,466.53	1,944,618.95	¹ 5,649,021.17
Revested Oregon and California railroad lands and timber.....			634,075.25	² 634,075.25
Revested Coos Bay wagon road lands and timber.....	113,783.86		36,923.24	³ 150,707.10
Receipts under Taylor Grazing Act.....	154,283.30	⁴ 110,359.92	264,643.22	⁵ 529,286.44
Potash deposits, royalties, and rentals.....	9,603.20	72,301.26	36,011.99	⁶ 117,916.45
Copying fees.....	17,812.20			17,812.20
Power permits.....	13,016.00			13,016.00
Reclamation town sites.....		7,022.25		7,022.25
Miscellaneous (including proceeds of standing timber, coal leases, and town lots in Alaska, rent of land, etc.).....	19,875.65			19,875.65
Total.....	1,357,269.83	3,057,405.01	2,919,241.05	7,333,915.89
Sales and leases of Indian lands.....				⁶ 65,924.05
Aggregate.....				7,399,839.94

¹ First and fourth columns contain \$26,654.99 royalties received in Wyoming under act of June 26, 1926.

² This amount will be paid to certain counties in Oregon in lieu of taxes.

³ 25 percent, exclusive of commissions, is payable to Coos County.

⁴ 50 percent is payable to the several States and 25 percent of receipts from licenses within grazing districts is available for range improvements. All other items in the second column go to the reclamation fund.

⁵ All of the \$21,884.48 received under the act of Oct. 2, 1917, and 52½ percent of the \$96,031.97 received under the act of Feb. 7, 1927, go to the reclamation fund. 37½ percent of that amount is payable to the State and 10 percent remains in the general fund.

⁶ Included in receipts from Indian lands is \$21,362.85, royalties on oil and gas from Kiowa, Comanche, and Apache lands, south half of Red River, Okla., of which the State receives 37½ percent in lieu of all taxes on tribal lands.

REPAYMENTS

Under the repayment laws there were stated 89 accounts, allowing repayment of \$6,956.72, and 28 claims were denied. The claims allowed include three accounts granting repayment of \$935 received in connection with sales of Indian reservation lands and repaid from Indian trust funds.

HOMESTEAD ENTRIES

Actions.—Actions were taken in homestead cases as follows: On final homesteads, 7,086; on second-entry applications, 187; on applications to amend, 97; on applications for leaves of absence and for extensions of time to establish residence, 1,066; on original entries, 6,118; and on appeals from actions of district land officers and this Office, 9,260.

PUBLIC SALE AND TIMBER AND STONE APPLICATIONS

Actions.—Five hundred actions were taken on public sale applications, 15 of which were approved for patenting; and 23 actions were taken on timber and stone applications, 9 of which were approved for patenting.

FILING OF PLATS OF SURVEY

Letters of instruction were issued for the filing of 306 plats of survey for lands in States in which there are district land offices. Thirty plats were directly filed by this Office in connection with which 13 public notices were prepared, for lands in States in which there are no district land offices.

NATIONAL FOREST HOMESTEAD LANDS

Nine thousand one hundred and eighty-three acres in national forests which had been listed for homestead entry under the act of June 11, 1936 (34 Stat. 233), were returned to national forests by revocation of the listing orders and 235 acres were restored to homestead entry under said act.

CONTESTS, OTHER THAN MINERAL CONTESTS

Nine hundred and twenty-one contests, including both Government and private, were considered. Approximately 123 hearings were held in Government cases. At the close of the year about 40 contest cases were pending.

MINERAL LEASES AND MINING CLAIMS

Oil and gas leases.—One thousand and twenty-eight cases were acted upon in connection with the issuance of leases pursuant to section 14 of the act of February 25, 1920 (41 Stat. 437), as a reward for the

discovery of oil or gas on permit areas. Sixty-three leases, embracing 43,329.90 acres, were delivered to the lessees. In addition, 7 leases were sold under section 17 of the act, embracing 1,302.48 acres, on which the total amount of bonus received was \$85,668.10. One lease was canceled.

On July 1, 1936, there were pending 2,389 applications for oil and gas leases under the act of August 21, 1935 (41 Stat. 674). Two thousand and eighty-three additional applications were received, making a total of 4,472. Of these, 176 were finally rejected in their entirety and 29 in part. Fifty-nine leases were issued, embracing 57,831.04 acres, 1 lease was canceled, 9 appeals were transmitted to the Department, and 554 other actions were taken. Altogether, 235 applications were disposed of, leaving 4,237 applications pending on June 30, 1937.

Oil and gas prospecting permits.—Eight hundred and ninety-eight oil and gas permits were granted, embracing approximately 564,849.43 acres. Four permits were reinstated. There were 567 assignments acted upon and 1,986 actions were taken on applications for extension of time. Eight hundred and forty-one permits were held for cancellation and 224 were canceled; 709 applications were rejected in entirety and 475 in part. There were 5,172 other actions taken.

Lease of water wells.—Four applications to lease water wells were received under section 40 of the mineral leasing act, which section was added by the act of June 16, 1934 (48 Stat. 977). The issuance of two leases has been approved by the Department.

Coal.—There were issued 32 coal prospecting permits covering 31,071.22 acres; 31 leases involving 4,877.38 acres; and 11 licenses for 440 acres. The total number of cases disposed of was 1,982.

Potash, sodium, sulphur, and phosphate.—Pursuant to departmental orders nos. 799, 817, 854, and 914, there were no potash permits or leases issued during the year under the act of February 7, 1927 (44 Stat. 1057.) One hundred and forty-four potash permits were canceled. There were issued 24 sodium prospecting permits, involving 29,763.82 acres. Nineteen sodium permits expired by limitation and one lease was canceled. Eighteen sulphur permits, involving 11,525.80 acres were granted and 26 permits expired by limitation. Altogether, there were 807 cases disposed of.

There were issued a total of 118 leases, licenses, and permits for coal, sodium, and other minerals, involving 78,438.22 acres.

Mineral applications and entries.—There were 99 mineral applications disposed of and 23 mineral entries were approved for patent.

Mineral contests.—Exclusive of oil-shale, Boulder Dam and Reservoir project and the San Gabriel Canyon claims, there were 235 mineral contests disposed of.

Proceedings against mining locations.—Final action has been taken on all the reports submitted on mining claims in conflict with the right-of-way for reservoir purposes in the San Gabriel Canyon. All cases, except one contest, have been disposed of in the Boulder Dam and Reservoir project. In the Metropolitan Water District appropriate action was taken on 44 field reports. Action was taken on 250 field reports on mining claims in the All-American Canal project.

RIGHTS-OF-WAY

Nine railroad right-of-way applications were approved and 31 stock watering reservoir applications were disposed of. In addition, in other cases, 306 right-of-way applications were approved and 39 rejected. Eight hundred and ninety-five other actions were taken.

FEDERAL RECLAMATION PROJECTS

There are 46 Federal reclamation projects in 14 western States, 22 of which are operated in whole or in part by irrigation districts and water users' associations. There are in addition five Indian reclamation projects, the irrigation features of which are under the supervision of the Office of Indian Affairs.

During the year 420 original reclamation homestead entries and 225 assignments of such entries were received; and 235 reclamation entries were approved for patenting.

DESERT-LAND ACT

One hundred and fourteen entries were approved for patenting under the desert-land act.

CAREY ACT

Carey Act segregations amounting to 51,340.23 acres were considered, on which either final or interlocutory action was taken.

PITTMAN ACT

Twenty-eight cases were received under the Pittman acts of October 22, 1919 (41 Stat. 293), and September 22, 1922 (42 Stat. 1012). Action has been taken in all but 16 cases.

SWAMP AND OVERFLOWED LANDS

Under the swampland acts, there were approved and patented to the States 1,846.51 acres and claims for 2,464 acres were finally rejected. New claims were asserted during the year for 738.54 acres.

STATE GRANTS AND SELECTIONS

New indemnity school-land selections, embracing 1,937.37 acres were received during the year and selections amounting to 43,729.81 acres were approved and title conveyed to the States. Such selections

involving 14,984.99 acres were canceled. Pending selections under quantity grants to States, for specific purposes, embracing 30,690.17 acres, were approved and title conveyed to the States.

Selections under the exchange provisions of the act of May 23, 1930 (46 Stat. 378), as amended by the act of February 21, 1931 (46 Stat. 1204), were approved and title conveyed to the State of Arizona, embracing 2,809.61 acres, and selections under the exchange provisions of section 2 of the Arizona Navajo Boundary Act of June 14, 1934 (48 Stat. 960), were approved and certified to said State, amounting to 19,196.24 acres.

Applications for patents for granted school sections under the provisions of the act of June 21, 1934 (48 Stat. 1185), were approved for patent, amounting to 1,000,678.62 acres. Such applications pending at the end of the year embrace 1,806,822.47 acres.

New applications under the Taylor Grazing Act by the various States for exchanges of lands were received, numbering 193 and embracing a total area of approximately 800,000 acres. The area in pending applications at the close of the year was 2,180,212 acres. In 71 cases field examinations were requested. Publication was ordered in the case of 20 applications, involving approximately 94,800 acres. The rejected and relinquished applications embraced 220,500 acres. Patented selections included 6,230.28 acres.

RAILROAD GRANTS AND SELECTIONS

Railroad and wagon-road listings and selections were received embracing 2,084.14 acres; 727.14 acres were certified or patented in satisfaction of such grants; and 221.19 acres of selections were rejected.

REVESTED OREGON AND CALIFORNIA RAILROAD AND RE-CONVEYED COOS BAY WAGON ROAD GRANT LANDS

Transactions concerning revested Oregon and California Railroad and Coos Bay Wagon Road grant lands for the fiscal year follow:

Restored to entry, etc.—No revested Oregon and California railroad grant land was restored to homestead entry and 944.96 acres were reclassified as timber land.

Timber sales.—Ninety-eight sales of timber on the revested Oregon and California railroad grant lands were made during the past year, involving 9,939.10 acres of land, containing 363,459,000 feet, board measure, of timber, for which the sum of \$598,548.65 was received. Total sales to June 30, 1937, 1,138, involving 134,634.73 acres, containing 3,331,087,980 feet, board measure, of timber, for which a total of \$7,469,481.14 has been received.

Eleven sales of timber on the reconveyed Coos Bay Wagon Road grant lands were made during the past year, involving 1,440 acres

of land, containing 67,265,000 feet, board measure, of timber, for which the sum of \$144,303.05 was received. Total sales to June 30, 1937, 122, involving 19,740.78 acres, containing 798,377,000 feet, board measure, of timber, for which a total of \$1,835,664.67 has been received.

Timber rights terminated.—Rights under timber patents were terminated in 120 cases.

ABANDONED MILITARY RESERVATIONS

The sum of \$2,897.19 was received from entries and sales of lands in abandoned military reservations. Eight homestead entries and 10 cash sales were approved for patenting.

ALASKA

Leases of public lands in Alaska for fur-farming required 42 actions. Four leases were canceled, 2 were issued, and 2 expired and were not renewed.

Leases of public lands in Alaska for grazing required 14 actions. One lease application was rejected.

Seventy-nine actions were taken in connection with the sale of small tracts in Alaska for homesites or headquarters, and 1 patent was issued. Thirteen actions were taken in connection with trade and manufacturing site applications and 1 patent was issued.

AVIATION LEASES

Two applications for lease of public lands for aviation fields were rejected, 1 lease was reinstated, 10 leases were canceled, and 41 other actions were taken.

COLOR OF TITLE

Sixteen applications for the sale of improved or cultivated public lands held under color of title for more than 20 years were approved for patenting. One hundred and eighty-three actions were taken in such cases, from which the sum of \$1,085.22 was received.

Twenty applications for lands formerly involved in the boundary dispute between the States of Texas and New Mexico were approved for patenting.

EXCHANGES

Various acts of Congress provide for exchanges in order to effect consolidations of Federally or privately owned lands or for other specified purposes. Eighteen patents were issued in such cases and title was accepted to about 150,000 acres of land for inclusion in national forest and other reservations.

The Secretary of Agriculture was notified in 64 cases that a timber permit might issue to the exchange applicant.

Ninety-four applications have been received under section 8 of the Taylor Grazing Act, involving 299,196 acres of public land. Of such number, 75 were received during the year. Twenty-three await reports from the Division of Investigations, 39 await reports from the Division of Grazing, 11 await additional evidence to be supplied by the applicants, 3 are under consideration by this Office, and 15 have been finally rejected and closed. The pending applications involve 197,238 acres of public land.

GRAZING LEASES UNDER TAYLOR GRAZING ACT

Five thousand nine hundred and twenty-four applications for grazing lease were filed; 2,736 were rejected and closed and 2,871 original and 661 supplemental grazing leases were issued, embracing approximately 5,642,915.98 acres.

INDIAN LANDS AND CLAIMS

Sales of pine timber on ceded Chippewa Indian lands in Minnesota resulted in the logging of 13,409,220 feet of white and Norway pine, spruce, cedar, and aspen timber and of 15,618.2 cords of spruce and balsam pulpwood. These operations resulted in the collection of \$137,681, which was deposited to the credit of the Chippewa logging fund.

Entries and sales of ceded Indian lands required 3,574 actions and resulted in the issuance of 154 patents. The sum of \$44,139.76 was received from such transactions.

The matter of the issuance or reissuance of fee and trust patents on Indian allotments was considered in 385 instances. One hundred and sixty-one cases were approved for patenting.

Claims by non-Indians within confirmed Indian pueblos in New Mexico were considered in 979 cases, all of which were approved for patenting.

Extensive reports were submitted with reference to the claims of the *Choctaw and Chickasaw Indians v. United States* and the *North-western Band of Shoshone Indians v. United States*, which claims are now pending in the United States Court of Claims.

One thousand three hundred and seven and forty-eight hundredths acres of land were added to the Western Navajo Indian Reservation through the medium of exchanges which required 52 actions. Five patents were issued in such cases.

PRIVATE LAND CLAIMS

Private land claims which were recognized or confirmed by many acts of Congress in the early history of the Government required 198 actions. Twenty-two patents were issued for such claims.

TIMBER

Sales of dead, down, or damaged timber were considered in 101 instances. The sum of \$3,746.95 was received from such timber sales.

Permits for the free use of timber required special consideration by this Office in 14 cases.

TOWN LOTS

Town lot matters required 244 actions. One hundred and nine town lot patents were issued and payments aggregating \$18,689.50 were received from town lot sales.

TRESPASS

Coal trespass was considered in 76 cases, in which \$942.80 was accepted in settlement; and timber trespass in 391 cases, in which \$8,997.05 was accepted in settlement. Other trespass cases considered were as follows: Gravel, 8; fire, 3; rock and turpentine, 1 each; and grazing, 1.

MISCELLANEOUS CASES CONSIDERED

Other actions were taken and patents issued as follows: Arkansas drainage, 111, with 3 patents issuing; cash and credit entries, 30, with 9 patents issuing; cemetery sites, 4, with 1 patent issuing; park applications, 8; preemptions, 3, with 3 patents issuing; quitclaims, 10; scrip 27, with 3 patents issuing; small holding claims, 40, with 5 patents issuing; and soldiers' additional, 639, with 4 patents issuing. Mud Lake, Minn., claims for relief were approved in 3 cases.

TRACT BOOK NOTATIONS

More than 100,000 notations were made on the tract books. This includes 13,650 appeals and other miscellaneous cases, 2,383 grazing applications, 6,042 final and cash certificates, 2,295 oil and gas applications, 174 coal applications, 542 original entries, and 407 plats.

Withdrawals and classifications.—Five hundred and forty-two Executive and other orders were noted. These include withdrawals for stock driveways, national forests, restored lists, power site reserves and classifications, grazing districts, and mineral and other classifications and revocations thereof.

Relinquishments.—Entries numbering 1,099 were relinquished and noted.

Supplemental patents.—Supplemental patents numbering 160 under the act of April 14, 1914 (38 Stat. 335), eliminating coal reservation because land was classified as noncoal, were directed to be issued.

Status cases.—Status was furnished in 18,036 cases for adjudicating clerks.

Township diagrams.—Diagrams showing disposals and status, in 864 townships and fractional townships, were made for this and other Bureaus.

MINERAL WITHDRAWALS AND CLASSIFICATIONS

A summary of the outstanding mineral withdrawals and classifications as of June 30, 1937, is as follows:

	Withdrawn	Classified
Coal.....	26, 971, 813	33, 276, 103
Oil.....	5, 168, 593	71, 884
Oil shale.....	5, 989, 949	4, 081, 208
Phosphate.....	1, 889, 601	302, 219
Potash.....	9, 411, 906	-----
Total.....	49, 431, 862	37, 731, 414

The area of the withdrawn oil land, shown above, includes 13,578 acres withdrawn as a helium reserve. The figures given include much land which has been patented with or without a reservation of minerals. The areas so patented have not been computed. However, some or all minerals have been reserved in patents aggregating 42,101,318 acres issued under the stock-raising and other laws, for lands not withdrawn or classified as valuable for minerals, as well as for lands so withdrawn or classified.

WITHDRAWALS AND RESTORATIONS

Three new national monuments were established and 3 enlarged, involving the reservation of 1,511,937 acres. The area of the national forests was increased by 14,077,784 acres, largely through the creation of 12 new forests. Eleven new wildlife refuges were established and 6 were enlarged, and a new cooperative game range within a grazing district was created, while small areas were released from existing refuges, resulting in a net increase of 566,909 acres.

Withdrawals amounting to 65 acres were made for air navigation sites for the Department of Commerce, while 3,037 acres were released from former withdrawals for such use. A tract of 160 acres was sold to the State of Florida under the recreation law, 3 recreational petitions were denied and 160 acres released from recreational withdrawal. Three new stock driveways were established and 5 enlarged and 16 reduced, resulting in a net decrease of 520,438 acres.

A withdrawal of 110,764 acres of public land was made for use by the Resettlement Administration; 49 acres were withdrawn as look-out sites in Federal and State cooperative fire-protection work; 40

acres were withdrawn as an experiment station, and a small tract in Arizona was withdrawn for town-site purposes. Withdrawals for lighthouse purposes, amounting to 1,208 acres, were revoked and public water reserves were reduced by 240 acres.

TABLES

The following tables show the facts as to entries made, patents issued, etc., during the fiscal year.

Original Entries

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	156	67,956	18	6,953
Enlarged.....	14	3,118		
Reclamation.....	155	17,463	26	3,561
Forest.....	24	1,655		
Section 2289, et al.....	212	20,729	4	342
Total homesteads.....	561	110,921	48	10,856
Deserts.....	8	1,242		
State selections.....	2	966		
Railroad selections.....	2	107		
Applications and filings.....	176			
Miscellaneous.....	21	376	10	62
Total.....	770	113,612	58	10,918
Indian land as above.....	58	10,918		
Grand total.....	828	124,530		

Final Entries

	Public land		Indian land	
	Number	Acres	Number	Acres
Homesteads:				
Stock raising.....	3,623	1,668,119	111	47,338
Enlarged.....	433	110,302	80	12,649
Reclamation.....	183	17,835	45	4,036
Forest.....	48	5,286		
Commuted.....	23	2,017	19	1,531
Section 2289, et al.....	1,131	113,264	70	6,327
Total homesteads.....	5,441	1,916,823	325	71,881
Deserts.....	129	16,927		
Public auction.....	17	2,077		
Timber and stone.....	5	169		
Mineral.....	112	4,906	1	41
Miscellaneous.....	1,696	12,362	66	1,017
Total.....	7,400	1,953,264	392	72,939
Indian land as above.....	392	72,939		
Grand total.....	7,792	2,026,203		

Patents and Certificates

	Number	Acres
Homesteads:		
Stock raising.....	2,887	1,419,778
Enlarged.....	430	105,765
Reclamation.....	219	18,850
Forest.....	37	3,679
Section 2289, et al.....	1,075	117,346
Total homesteads.....	4,648	1,665,418
Deserts.....	131	17,347
Public auction.....	15	1,638
Timber and stone.....	7	359
Mineral.....	29	1,307
Railroad.....	6	851
Miscellaneous.....	1,443	427,222
Total patents.....	6,279	2,114,142
Certified to States.....		96,426
Grand total.....	6,279	2,210,568

State Grants—Areas Patented or Certified

State	Swampland patents	School section indemnity certifications	Other grants confirmed ¹
	Acres	Acres	Acres
Arizona.....		43,690	28,236
California.....	38		
Florida.....	47		
Iowa.....			1,000,679
Louisiana.....	1,703		
Michigan.....	40		
New Mexico.....			30,690
Oregon.....		40	
Wisconsin.....	18		
Total.....	1,846	43,730	1,059,605

¹ Includes quantity grants, exchange selections, and patented school lands in place.

Railroad Grants—Land Approved for Patent or Certification

	State	Acres
To Corporations:		
Central Pacific.....	California.....	428
Central Pacific (California & Oregon).....	do.....	299
Total.....		727
To States:		
St. Paul, Minneapolis and Manitoba (Great Northern).....	Washington.....	91
Grand total.....		818

DIVISION OF GRAZING

F. R. Carpenter, *Director*

THE Division of Grazing was entering its third year of operation under the Taylor Grazing Act at the beginning of the fiscal year 1936-37. Whereas the first 2 years of the administration were principally occupied in acquainting the people of the West with the provisions of the law, building and perfecting an organization, and establishing rules and regulations governing the issuance of grazing privileges, the third year has been occupied mainly in enlarging that program and stressing activities which would lead to a solution of the many problems attendant upon the issuance of term permits.

In the preamble of the act, "To stop injury to the public grazing lands by preventing overgrazing and soil deterioration, to provide for their orderly use, improvement, and development, to stabilize the livestock industry dependent upon the public range, and for other purposes", the mission of the Division of Grazing is aptly defined. In the beginning of the administration, there was a very limited amount of specific information available, and it was, therefore, necessary to operate under a plan that would afford the least injury to the livestock industry which the act was designed to help and at the same time, "to preserve the land and its resources." This was accomplished through the authority of section 2 of the act which provides that the Secretary of the Interior shall "do any and all things necessary to accomplish the purposes of this act and to insure the objects of such grazing districts, namely, to regulate their occupancy and use, to preserve the land and its resources from destruction or unnecessary injury, to provide for the orderly use, improvement, and development of the range." To regulate the use of the range, revocable licenses for grazing privileges were issued pending the time when sufficient data would be available upon which to issue term permits. The livestock in each grazing district were licensed to use public lands in conformance with general rules of the range approved March 2, 1936, as later amended, and local rules of fair range practice which provide for the recognition of local customs and administrative details.

The third year of administration developed in the Division a definite program of wildlife conservation and constructive means of bringing about through cooperative agreements the proper utilization of public ranges and a harmony of purpose involving this great natural resource. The range survey program was expanded in all grazing districts. In one grazing district, field work was completed and data compiled. Through cooperation with other Federal agencies, an enormous amount of information on this subject and conservation activities resulted.

Section 3 of the act prescribes that "Preference shall be given in the issuance of grazing permits to those within or near a district who are landowners engaged in the livestock business, bona fide occupants or settlers, or owners of water or water rights, as may be necessary to permit the proper use of lands, water, or water rights owned, occupied, or leased by them." Inasmuch as there is insufficient range available to grant privileges to everyone, the range survey program must of necessity assist in the determination of the preference properties upon which grazing permits can be based.

Of the outstanding accomplishments during the year, noteworthy are the determination of the proper relationship of the private and public lands involved, the study in range-carrying capacities, and the far-reaching cooperative agreements with local associations of stockmen and with Federal and State agencies, having as their objectives the preservation and rehabilitation of the land.

THE AMENDMENT TO THE TAYLOR GRAZING ACT

The Taylor Grazing Act was amended June 26, 1936, providing a number of changes and additions to the original act of June 28, 1934, which was the first law ever passed by the Congress to regulate grazing on the public domain. One of the important changes in the law is the provision increasing the 80,000,000-acre limit to 142,000,000 acres, permitting an additional 62,000,000 acres of public land to be included within grazing districts.

A new section, 17, was added to the law, providing that the President shall have power, with the advice and consent of the Senate, to select a Director of Grazing. Other personnel are appointed by the Secretary of the Interior from the civil service rolls. Practical range experience is taken into consideration by the Civil Service Commission in passing upon eligibles. The Director of Grazing, Assistant Director, and all graziers at the time of appointment must be bona fide citizens or residents, for 1 year immediately preceding their appointment, of the State or of one of the States in which they are to serve.

The amendment modifies sections 7, 8, 10, and 15 of the original act. The administration of these sections dealing with the sale, lease, and exchange of lands rests largely with the General Land Office.

ADVISORY BOARD CONFERENCE

At the invitation of Secretary of the Interior, Harold L. Ickes, the general chairmen of the advisory boards of the 37 grazing districts then established and administered by the Division of Grazing met in Washington on July 8 and 9, 1936, to confer with the Secretary, officials of the Division of Grazing, and the heads of bureaus whose work is connected with that of the Division. The purpose of the meeting was to discuss matters of general policy concerning the regulation of the present grazing districts and to decide whether the same methods of administration should be used to control the new grazing districts. These new districts were to be created from the 62,000,000 additional acres of public domain placed under the jurisdiction of the Division by the Taylor Grazing Act as amended June 26, 1936. In general, the stockmen endorsed the administration of the provisions of the Taylor Grazing Act and approved the continuance of the present policies. At a conference with Robert Fechner, Director of Emergency Conservation Work, the livestock leaders appealed for additional Civilian Conservation Corps camps to carry out necessary range rehabilitation. Mr. Fechner expressed his desire to give all assistance possible to this work but indicated that it would be practically impossible to allocate more camps for it before April 1, 1937.

The advisors were received by President Roosevelt, who complimented them on the work being done to conserve the public domain, and showed not only a great interest in, but also a keen understanding of their problems.

Immediately following the conference with the advisory board chairmen, the Director conducted State-wide meetings in the West to consider the placing of additional lands within grazing districts. As a result, 12 new districts were established.

In accordance with the Rules for Administration of Grazing Districts which provides that an election of district advisors shall be held in each grazing district within 90 days after the promulgation of the order establishing said district, elections for choosing advisory board members were held in each of the new districts. As rapidly as possible thereafter, the districts were brought under administration.

SECOND ANNUAL CONFERENCE

The second annual conference of members of the Taylor Grazing Act advisory boards was held in Salt Lake City from December 9 to December 11 with nearly 1,000 interested stockmen in attendance. In an open forum, there were discussed at length each of the topics to be taken up later by State committees and whipped into shape by national committees for presentation to the Secretary of the Interior.

The delegates met by States and considered each of the topics. Two representatives from each State were selected to serve on six

major national committees, which drafted resolutions to be presented to the assembly. The representatives were instructed by stockmen from their respective States as to the State sentiment.

The six national committees drew up resolutions covering the following-named general topics: Licenses, permits, fees and finances, improvements, legislation, and range surveys. At the final session, the resolutions were presented to the assembly and acted upon as recommendations to assist the Secretary of the Interior in the administration of the act during 1937.

Among other resolutions, one called for an increase in the number of C. C. C. camps assigned to the Division of Grazing. It was pointed out by the committee that the Division now has only 45 camps carrying on improvements in the vast public domain of 140,000,000 acres. The resolution urged that every grazing district be given at least one camp and as many more as are necessary.

The delegates recommended that the personnel engaged in range surveys be enlarged and went on record as approving the standards of work and the methods established by the range surveys branch of the Division of Grazing.

LICENSES

Fifteen thousand sixty-seven temporary licenses were issued during the year for 7,434,416 head of livestock, a detailed summary of which is shown in the following table. These licenses were issued on a temporary basis, pending the completion of land-classification studies and a determination of the commensurate ratings of properties dependent on the public ranges, and are revocable for violation of the terms thereof.

Grazing Licenses Issued by the Division of Grazing, 1936

State	Dist. No.	Cattle	Horses	Sheep	Goats	Number of licenses	Number of stock
Arizona.....	1	30,752	146	147,962	10,235	258	189,095
	2	7,827	19	12,360	1,115	83	21,321
	4	18,445	164	348	15,119	183	34,076
		57,024	329	160,670	26,469	524	244,492
California.....	1	16,831	433	141,445	210	174	158,919
	2	41,274	2,215	114,940	102	478	158,531
		58,105	2,648	256,385	312	652	317,450
Colorado.....	1	53,173	3,419	154,362	79	478	211,033
	2	31,049	629	42,762		218	74,449
	3	66,735	2,656	188,814	349	663	258,554
	4	20,541	715	142,653	423	338	164,332
	6	7,023	983	94,690	30	164	102,726
		178,458	8,402	623,236	881	1,861	811,085
Idaho.....	1	65,141	6,824	439,347	26	1,093	511,338
Montana ¹	2	19,944	11,868	167,257	14	387	199,083
	3	25,798	3,183	133,783	249	318	163,013
	4	4,449	516	27,379		80	32,344
		50,191	15,567	328,419	263	785	394,440

¹ No license issued in Montana district no. 1 in 1936.

Grazing Licenses Issued by the Division of Grazing, 1936—Continued

State	Dist. No.	Cattle	Horses	Sheep	Goats	Number of licenses	Number of stock
Nevada.....	1	139,294	8,438	389,796	3	377	537,531
	2	63,538	4,966	283,870	70	332	352,444
		202,832	13,404	673,666	73	709	889,975
New Mexico ²	3	130,450	5,324	16,020	40,702	896	192,496
	4	40,516	3,272	75,770	36,772	526	156,330
	5	14,855	1,872	27,131	8,626	126	52,484
	6	153,293	8,865	359,283	14,104	1,013	535,545
		339,114	19,333	478,204	100,204	2,555	936,855
Oregon.....	1	4,401	144	11,429	-----	37	15,974
	2	57,572	5,292	264,270	-----	387	327,134
	3	38,564	4,783	189,464	-----	376	232,812
	4	20,191	2,739	90,760	-----	138	113,690
	5	15,295	1,494	45,695	-----	158	61,884
	6	22,098	1,399	52,845	-----	291	76,351
		158,121	15,851	653,873	-----	1,387	827,845
Utah.....	1	25,346	3,123	218,272	-----	368	246,741
	2	15,924	1,320	395,896	235	635	413,375
	3	32,869	1,620	506,996	2,629	1,407	544,114
	4	26,934	1,518	224,313	25,085	905	277,850
	5	21,669	2,061	163,004	240	541	126,974
	6	26,096	1,842	192,932	-----	290	220,870
	7	23,762	2,529	143,857	2,530	617	172,678
	8	15,407	1,120	182,902	-----	298	199,429
		188,007	15,133	1,968,172	30,719	5,661	2,202,031
Wyoming.....	1	36,929	3,289	258,687	-----	440	298,905
Total.....	37	1,333,985	100,780	5,840,704	158,947	15,067	7,434,416

² No license issued in New Mexico district no. 2 in 1936.

ORGANIZATION

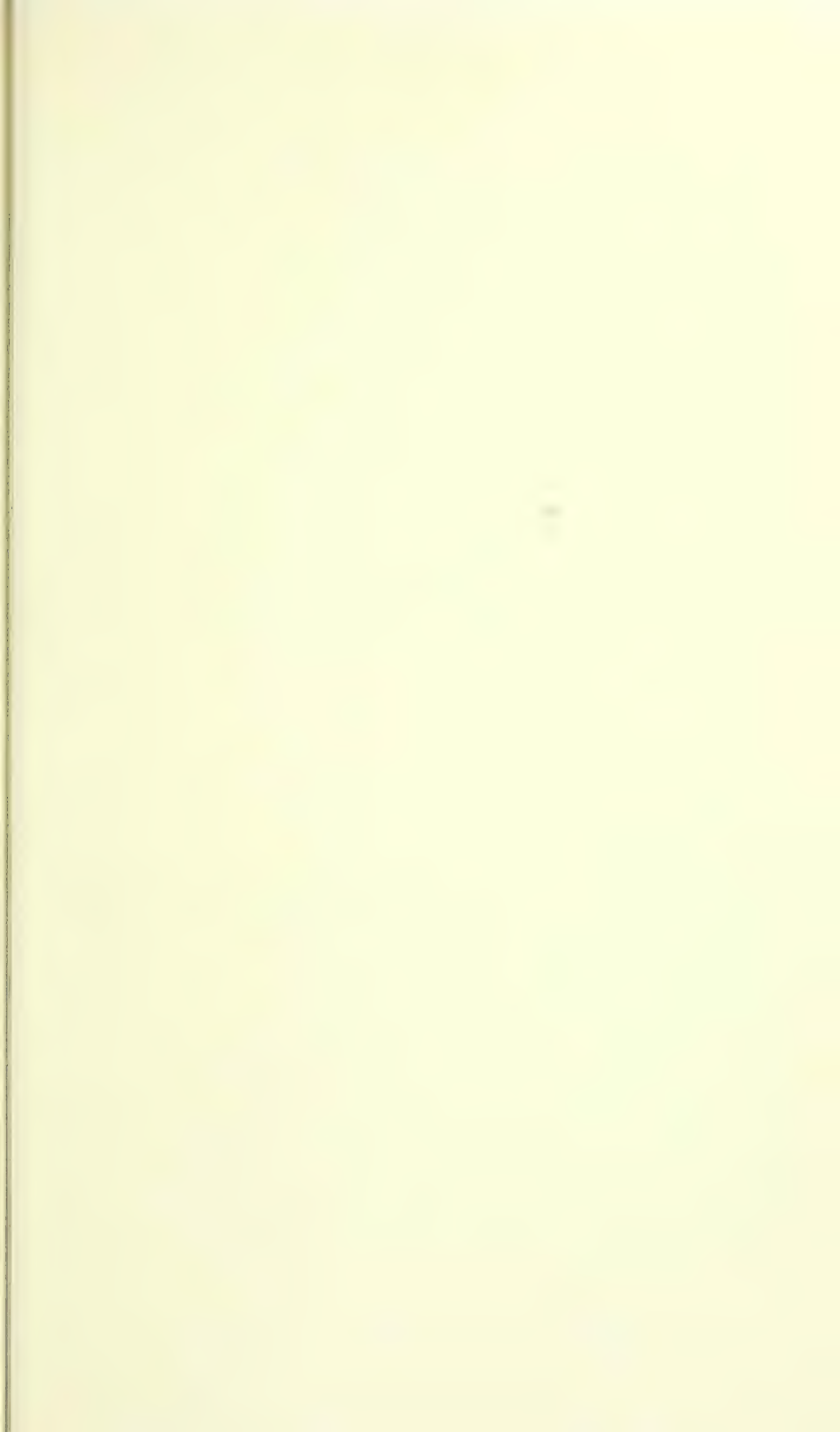
Following the principle of decentralizing administration as far as consistent, an administrative office was established in Washington, D. C.; a regional field headquarters office in Salt Lake City, Utah; and 10 regional offices located in Salt Lake City, Utah; Reno, Nev.; Burns, Oreg.; Boise, Idaho; Billings, Mont.; Grand Junction, Colo.; Albuquerque, N. Mex.; Phoenix, Ariz.; and Rawlins, Wyo.

Each regional office is in charge of a regional grazer, who is assisted by one or more graziers and office personnel. At the close of the year, the Division had in its employ a total of 91 permanent employees, 16 in the Washington office and 75 in field offices.

Each of the 49 districts now functioning has a board of district advisors whose duties as provided in the Rules for Administration of Grazing Districts are as follows:

District advisors shall make recommendations on the following-named matters:

1. The carrying capacity of the public range of the district.
2. The issuance of grazing licenses. (District advisors shall not make any recommendations upon their own applications, but such applications shall be acted upon by the Director of Grazing.)
3. Proper rules for fair range practice.
4. Temporary range allotments by classes of livestock or for community or individual use.





SHEEP GRAZING ON THE PUBLIC RANGE.



A NOW FAMILIAR SCENE IN ONE OF THE GRAZING DISTRICTS WHICH HAVE BEEN SET UP TO PROTECT THE RANGE.

5. Seasonal use of the public-domain range, or any part thereof.
6. Approval or rejection in whole or in part of recommendations of local associations of livestock men in the district.
7. Other matters upon which their opinion may be requested by the Secretary of the Interior.

The advisory boards, whose members total 678, have worked diligently, and their recommendations and the almost limitless fund of information as to local conditions and requirements have contributed greatly to the principles of conservation and prudent usage adopted by the Division. In carrying out the duties assigned to them, the advisory boards have materially assisted in the details of administration.

RANGE SURVEY PROGRAM AND LAND CLASSIFICATION

The range survey program of the Division of Grazing, which was inaugurated in March 1936, has geared its activities to the needs of the administration in harmony with section 3 of the act. The scope of this survey includes not only the determination of the carrying capacity and proper seasonal use of the public range but also the examination of the private lands and water within these districts and the ascertainment of the right relationship of each to the other. Base maps must be prepared and ownership status assembled. The essential facts of private control of private lands are also ascertained.

In New Mexico Grazing District No. 5, field work is completed and data assembled for the determination of preferences for permits, and it is expected that this district will be on a permit basis by January 1, 1938. Likewise, in Colorado Grazing District No. 6, the field work is practically completed, and it is anticipated that permits will be issued also in that district beginning with the 1938 grazing season. The intensive studies in these two widely divergent districts will serve as a basis for the determination of preferences for grazing permits where such preferences are based primarily on (1) water, as in the Southwestern States, and (2) land, as in the Northwestern States. In all other districts, the work is progressing at a remarkable pace considering the magnitude of the task.

Plans are under way to step up the range survey program by means of additional personnel qualified in that field. By coordinating the range survey program with that of the many agencies with which the Division has worked out cooperative agreements, it is anticipated that sufficient data to have all districts on a permit basis will be made available by 1940.

The classification of lands with respect to their value for agricultural purposes as required by the various land laws is a duty of the Division of Grazing. This classification involves all lands located within or without the boundaries of grazing districts which are applied

for as homestead entries under section 7 of the Taylor Grazing Act as amended June 26, 1936.

It is also the duty of the Division to make determinations as to the propriety of approving applications under section 7 for other purposes than agriculture and applications under sections 8, 14, and 15 of the Taylor Grazing Act from the standpoint of public benefit where the lands involved are located within grazing districts.

The recommendations for designations of lands applied for under the enlarged and stock-raising homestead acts and determination of the value of watering places for public purposes, together with the preparation of appropriate orders, are other functions of the Division of Grazing. The designations under the enlarged and stock-raising homestead acts are made principally for the purpose of permitting the adjudication of homestead entries having valid claims established prior to the Executive orders of November 26, 1934, and February 5, 1935, withdrawing public lands for classification.

The work of classification is performed on the basis of information and records available to the Division and in cooperation with the Division of Investigations and General Land Office.

At the beginning of the present fiscal year, there were 1,080 cases pending under sections 7, 8, 14, and 15. During the year, 2,130 cases were received, making a total of 3,210 cases to be acted upon. Of this number, 2,598 were acted upon, leaving 612 cases pending at the end of the year. One hundred fifty-six cases under the enlarged and stock-raising homestead acts were acted upon, and, on June 30, there were 80 cases pending action by the Division; 1,360 acres were designated under the enlarged homestead act in nine States, increasing the total acreage so designated to 268,470,225 acres; 3,520 acres of land were designated under the stock-raising homestead act in eight States, increasing the outstanding area to 102,440,062 acres. During the fiscal year, 1,775 acres in 7 States were included in water reserves, and 280 acres in 1 State were excluded from such reserves, increasing the gross public water reserve areas in 12 States to 511,523.

RANGE IMPROVEMENT

Authority is granted the Secretary to rehabilitate overgrazed and eroded areas. Construction, purchase, and maintenance of range improvements are authorized under section 10 of the act from the 25 percent of all moneys received when appropriated by Congress. Up to July 1, 1937, \$53,281.56 had been allotted for expenditure under the provisions of this section.

This money was apportioned according to the amount of grazing fees collected in each district, and the resulting improvements consisted mainly of fencing; posting stock driveways; extermination of rodents, insects, and predatory animals; purchase of poison mix and

fence material; maintenance of water development; and construction of stock trails.

The Department, on October 20, 1936, formally accepted 183 watering facilities developed on the public domain of Utah under the Utah Emergency Relief Administration range-improvement program. These improvements consisted of spring developments, reservoirs, and wells, the latter equipped with engines, pumps, windmills, storage tanks, and troughs. Local stockmen, through properly selected representatives, took an active part in this range-improvement program. Had there been no regulation or control of grazing in the areas served by these waters, their inestimable value to the range and to the public would indeed have been short lived. Under this program, a skeleton distribution of stock water was developed on 25,000,000 acres of public domain. This has since been augmented by auxiliary and primary improvements under Emergency Conservation Work projects in the Division of Grazing. All of these facilities contribute to beneficial and orderly use of the range. To operate properly and administer many of the wells, it is necessary to maintain well operators during the season of use, not only for the protection of the well equipment but also in order that sufficient water may be available when needed. This is particularly true of wells located on stock driveways. Various associations of stockmen have offered to enter into agreements to operate wells of this character. On June 30, 1937, a form of agreement was approved by the Department which is of sufficient scope to afford ample protection to the public and to the Government property involved. It will open the way for maximum enjoyment of these facilities and at the same time relieve the Division of the expense that its otherwise necessary direct supervision would entail.

EMERGENCY CONSERVATION WORK

The purpose of the Emergency Conservation Work activities of the Division of Grazing is to rehabilitate the public domain and to convert thousands of acres of formerly unused range into good grazing land for livestock. During the fiscal year 1937, there were a total of 45 C. C. C. camps assigned to the Division. The enrollees of these camps are supervised by the Army when in the camp and by the Division of Grazing, E. C. W., when engaged in the construction of improvements on the public land.

The work projects of the 45 C. C. C. camps being operated under the jurisdiction of the Division in the 9 Western States of Arizona, California, Colorado, Nevada, New Mexico, Idaho, Oregon, Utah, and Wyoming are those recommended by the advisory boards of the grazing districts in which the camps operate and in each case are planned to relieve the most acute need of the area whether it be water develop-

ment, fence construction, definition of stock boundaries, rodent control, or some other work of vital importance to proper range management. While the work accomplished has in each case proved of immediate benefit, construction was planned for future benefits as well and with the object not only of relieving present range conditions but also of providing future means of conservation and protection of the more than 110,000,000 acres of range land administered by the Division.

Water is the prime requisite of the public domain. Sections of the national range used partially or not at all in past years are being made available for grazing purposes largely through conservation and distribution of water. Dams have been built to impound the water from mountain streams and to preserve the early run-off, and water check-dams have been built in dry creeks for the purpose of arresting soil erosion in the wet seasons. The development of springs wherever they could be located has been accomplished, and, in many cases, wells have been sunk in an endeavor to provide watering places within close proximity of each other in order that the range may be more properly serviced and thus bring about a better distribution of stock. In connection with this water development, storage facilities such as troughs and tanks have been constructed. This not only conserves the water but also provides much better watering facilities.

Closely allied with the water program is the work of opening truck trails into the grazing regions and the building of stock trails for the movement of animals from winter to summer range or to market. This trail construction opens up large areas of grazing lands formerly inaccessible and not only furnishes much needed new pasture but also aids in the elimination of overgrazing in other areas. The holding corrals constructed along these trails allow stock to be held overnight on the way to market and are of great advantage to stockmen. A sufficient water supply is included in the construction of each corral. Bridge and cattle-guard construction are an important part of these trails and are of great assistance in expediting the movement of cattle and reducing losses of livestock.

An extensive rodent control program has proved of great benefit to stockmen in conserving forage. More than 2,000,000 acres have been treated for control of ground squirrels, gophers, prairie dogs, kangaroo rats, and jack rabbits. Eradication of poisonous weeds has proved very important in saving livestock, and 119,514 acres have been treated for infestations of poisonous larkspur, death camas, and other weeds which cause the death of hundreds of head of livestock.

EDUCATIONAL PROGRAM

The chief objectives of the educational program are vocational, character, and citizenship development with specific consideration given to job training. The enrollees are given every opportunity to

learn to operate the machinery used on the work projects, and, through the daily work in connection with classroom instruction, many skilled workers have been developed from completely untrained men. Systematic instruction on the job includes practice on the job in the field and at least 2 hours per week of systematic basic instruction underlying the work off the job. This basic instruction includes a general course in conservation. The effectiveness of the education and training on the job program of these C. C. C. camps and the interest of the enrollees in it may be judged from the fact that much of the difficult construction has been done under the supervision of foremen who were formerly enrollees. Their work has been approved by those competent to judge, and the value of this instruction to the enrollees themselves is immeasurable.

SAFETY PROGRAM

The safety program outlined by the Director of Emergency Conservation Work is being followed, and, through its application, the Division of Grazing, E. C. W., has maintained one of the best safety records in Emergency Conservation Work. One camp, DG-35, Milford, Utah, which has been operating since October 22, 1935, has not from its inception up to the present time had one lost-time accident.

The following table shows the accomplishments of the work projects of the Division's Emergency Conservation Work program:

Bridges.....	54
Fences (miles).....	588
Reservoirs.....	68
Springs.....	57
Wells—fully equipped.....	44
Cattle guards.....	37
Corrals.....	49
Truck trails (miles).....	1, 208
Stock trails (miles).....	106
Check dams.....	13, 319
Other flood-control structures.....	139
Acres treated for poisonous plant eradication.....	119, 514
Acres treated for insect pest eradication.....	31, 599
Acres treated for rodent eradication.....	2, 376, 417
Diversion dams.....	194

COOPERATION

1. Local Associations of Stockmen

To remedy the situation of interspersed land ownership, where State, county, tax-default, and privately owned lands are checker-boarded and intermingled with public domain lands, the Department early realized the necessity for some coordinated plan of management with a system of unified control for all these lands if economic and

sane use were to be established. To make possible this form of administration, the Secretary on March 17, 1936, approved a general form of cooperative agreement to be used in entering into agreements with local associations of stockmen. During the fiscal year ending June 30, 1937, the number of these cooperative agreements was increased by eight, and six more are pending. The total number of these agreements approved to date is 17.

Economic and sane use require orderly regulation and occupancy of the range and provide for proper utilization of the forage, all of which results in the rehabilitation and conservation of the natural forage resources which is the primary purpose of the Taylor Grazing Act and the chief objective of the Department. Administration under a cooperative agreement is designed to accomplish these purposes and permits a coordinated use of Federal, State, county, railroad, and tax-default lands which are so intermingled that the proper use of one cannot be had without use of the other. Under the terms of such an agreement, the Secretary of the Interior determines the proper season of use of all lands and fixes the fee to be charged for grazing public domain lands included in the agreement, and the association is required to acquire by lease or otherwise all State, county, tax-default and other privately owned grazing lands obtainable within the area covered by the agreement. The actual administration of the lands included in the agreement is vested in the board of directors of the association under general supervision of the Secretary. Through an agreement of this sort, thus, there is brought about a harmony of purpose and a constructive means of again placing these otherwise burdensome non-Federal lands on a self-supporting basis and effecting a plan for the conservation of all lands involved.

The Division of Grazing has no doubt reached an all-time high among agencies of the Federal Government in the matter of cooperation. Regulation of grazing on the public domain put into effect less than 3 years ago to "preserve the land and its resources" has crystallized opinion and effort as to the position this great resource occupies nationally and locally. The result has been amicable relations with all agencies in the interest of the natural resources and the welfare of 2½ million agricultural and industrial people who pioneered and built a civilization in its midst.

WILDLIFE

A program of wildlife management has been instituted by the Division as an important part of the administration of all grazing districts. The program may be divided into four parts: Cooperation with the stockmen and district advisory boards; range improvements through the Emergency Conservation Work of the Division; cooperation with the Bureau of Biological Survey in setting aside game

ranges to be used jointly by domestic livestock and game; and State plans for wildlife such as the New Mexico and Oregon plans.

The New Mexico plan as approved by the Secretary of the Interior has met with the approval of the varied interests in New Mexico where stockmen have always been very active in conserving wildlife. Under State supervision and control with the very effective cooperation of local stockmen, New Mexico has built up one of the finest mountain sheep herds in the United States.

The advisory board of Oregon Grazing District No. 3 adopted and recommended a wildlife program which has now been adopted by the advisory board of each of the six grazing districts in Oregon. It involves the cooperation of the Bureau of Biological Survey, the Fish and Game Commission, and the Forest Service in the formulation and enforcement of a practical, scientific wildlife program.

ENFORCEMENT

Enforcement under the Rules for Administration of Grazing Districts of March 2, 1936, and amendments thereto, has been maintained with satisfactory results. A large number of alleged trespasses have been investigated, trespass notices served, and trespasses abated. Administrative officers of the Division, assisted by temporary range riders during concentrated seasonal livestock movement on the range, have been successful in promoting orderly migration of stock over designated routes. The accomplishment has been mainly one of education and understanding. Considering the magnitude of the area and great number of migratory operators together with the fact that many of the operators were unfamiliar with the trails, allotments, and district lines, and the regulations, the result of enforcement activities is regarded as an exceptional achievement. The principal accomplishment is the prevention of a violation rather than the arresting of a violation after it has occurred.

HEARINGS AND APPEALS

Of the total number of applications for grazing licenses received and acted upon, comparatively few of the applicants were dissatisfied with the decisions of the regional graziers. Only 607 applicants, or 4 percent, filed motions for review before the regional graziers. In 284 cases of this number, it was necessary to hold a formal hearing; 130 cases were withdrawn or adjusted without the necessity of a formal hearing; and 193 cases are pending on appeal from the decision of the regional graziers. It may be seen that 96 percent or the vast majority was satisfied with the action taken by the field officers.

BUREAU OF MINES

John W. Finch, *Director*

FEW Government establishments are authorized as explicitly as the Bureau of Mines to undertake conservational activities. Section 2 of the organic act under which it operates (37 Stat. 681) states, in part:

That it shall be the province and duty of the Bureau of Mines, subject to the approval of the Secretary of the Interior, to conduct inquiries and scientific and technologic investigations concerning mining, and the preparation, treatment, and utilization of mineral substances with a view to improving health conditions and increasing safety, efficiency, and economic development, and *conserving resources through the prevention of waste in the mining, quarrying, metallurgical, and other mineral industries.*

In accordance with the duties delegated to the Bureau by the enabling act, many of its technologic and economic investigations are designed to conserve mineral wealth, and all of its work in health and safety is devoted to the conservation of human life.

The early history of our petroleum and natural-gas industry is a classic example of wasteful mineral exploitation. Incident to the development of one Texas field alone, billions of cubic feet of natural gas were lost in the atmosphere, and the old-time practice of letting new wells blow wild undoubtedly advanced the day when our oil reserves will be exhausted. Formerly only a small portion of the oil and natural gas underground was recovered, and although today perhaps half is recovered in best practice it is still the object of modern petroleum engineering to raise the percentage as much as possible. The Bureau has given technical assistance toward the realization of that ambition by work on the following important phases of oil conservation: (1) Prolonging the producing life of wells through application of better engineering practice; (2) estimating the probable life of wells by working out relations between rate of fluid production and pressure drop in the producing formation; and (3) avoiding wastes in transportation and storage.

The results of these studies as applied in actual practice have been of value not only to oil companies but to State commissions charged with regulation of production. A further service, particularly to the latter group, has been the Bureau's monthly forecast of the demand for petroleum products, which serves as a guide in controlling production.

America's supplies of solid fuels are estimated to be tremendous; nevertheless, depletion of high-grade coals in certain parts of the country, accompanied by such factors as high freight rates and more exacting standards of domestic consumers built up by intense competition from oil and gas, have led to studies by the Bureau that will not only result in more economical use of this fuel but in larger sales of the lower grades when offered in cleaner, more attractive condition than in the past.

The Bureau's service work as consulting fuel engineer to the Government has saved thousands of dollars in Washington alone and exemplifies the type of fuel economy possible not only in large heating installations but in small domestic boilers as well.

Great Britain, Germany, France, and Japan are preparing to supplement their inadequate petroleum stocks with gasoline obtained by the hydrogenation of lignite, tar, and bituminous coal. Germany can produce 800,000 tons of gasoline annually by this process and France 50,000 tons; Great Britain has produced 100,000 tons a year, and Japan soon will be able to manufacture 105,000 tons. Anticipating the time when America's petroleum reserves begin to fail and prices rise, the Bureau of Mines is operating a continuous hydrogenation plant at its Pittsburgh station to test the adaptability of various domestic coals to the process.

A continuing study of the Bureau has been research on methods for making America self-sufficient in strategic minerals, particularly those of importance in warfare. Many of our known deposits of chromite, manganese, nickel, and antimony ores have hitherto been considered of too low grade to justify development. The Bureau for some years has been attempting to devise low-cost methods of extracting a product of commercial grade from these minerals, in order to build up a potential source of supply and eventually to preclude the necessity of importation. Already the development of an electrolytic method of recovering pure metallic manganese indicates that this country may be able to produce all of its requirements of that important metal. Satisfactory methods have also been developed for concentrating western chromite ores and for producing pure chromium chloride cheaply.

The treatment of pegmatite tin ores is another metallurgic project that, if successful, may make it possible for this country to produce at least a part of its tin supplies now obtained from foreign countries.

Beneficiation of Southwest potash ores is progressing successfully, and tests in the Experimental mine on the bearing strength of potash ores are proving helpful, as the American potash mines become more extensive.

During the past few years there has been an insistent demand for larger supplies of lithium salts. Spodumene, one of the principal sources, occurs in large quantity in North Carolina. The Bureau has developed a cheap method of concentrating low-grade spodumene ore that promises to help establish a paying industry in the South.

More than 6,000,000 dozen pieces of ceramic wares are imported annually. It seems to have been a tradition that American clays were unsuitable for whiteware; but the Bureau has been proving that clays of the South and the Pacific Northwest can be fabricated into fine-quality ceramics, and is testing the firing of minerals locally available at the new experiment station at Boulder City.

A report of especial value in any study of strategic minerals was prepared. It discusses the occurrence, production, and international flow of 32 important mineral commodities and covers the mineral resources and demands of 12 major industrial countries, with recent legislation affecting control of the mining industries in them.

The industrial dislocations that accompanied the depression evicted many people permanently from their former occupations. Faced with the necessity of earning a living, numbers of persons tried mining, especially gold mining, which promised the most lucrative returns. The methods employed frequently were ingenious, but more often impractical and wasteful. Engineers of the Bureau covering mining districts often have been of practical assistance to these mining tenderfeet, showing them how to avoid wasteful practices, pointing out simpler methods, and indicating hazards. The revival of the small prospector has been an interesting feature of the present-day mining industry. Some of the publications prepared by the Bureau are written especially for these small operators, to give them information on mining and milling methods. Results of a special investigation of gold placer mining, undertaken in cooperation with the Works Progress Administration, were published during the year.

A number of years ago the Bureau established—and is continuing—a series of circulars, usually written by mine operators, describing methods of mining and milling at some of the country's most important mines. These are distributed on request, and comprise an abundant reservoir of data on the successful handling of mining and milling problems. In numberless instances application of the procedures described has permitted profitable exploitation of a mining property that otherwise might have failed. The flow sheets and

working drawings of specialized equipment that accompany these papers are no small factor in their usefulness.

The metallurgical industry has long struggled with the problem of smelter-smoke disposal; not only has smelter smoke polluted the atmosphere, with consequent injury to health and damage to vegetation, but escape of volatiles has wasted valuable constituents of ores. Moreover, in many cities coal smoke is an undesirable feature during the winter. Smelting companies and city governments alike are evincing keen interest in a device for precipitating solids from air or other gases, developed by the Bureau on a laboratory scale during the year and demonstrated successfully on a number of occasions.

Much attention has been focused on the scrap-metal industry. At one time exports to countries that are increasing their armaments attained proportions that many considered alarming, and stocks of this important source of metals were being rapidly depleted. So intense was the interest of the industry that, in addition to the seven nonferrous metals ordinarily included in the annual surveys of secondary material, the Bureau was encouraged to make consumption studies of iron and steel scrap. The canvass of the use of both primary and secondary tin was resumed at the request of tin consumers, anxious to note the effect on the industry of the Faddis-Barbour bill providing for licensing exports of scrap tin.

The Bureau makes annual studies of 109 minerals of commercial importance for its yearly publication, *Minerals Yearbook*. This volume, containing about 70 chapters reviewing trends in production and consumption of individual minerals or logical groups of minerals, is the outgrowth of more than 50 years of similar compilations, first delegated to the Geological Survey and later to the Bureau of Mines. A single book this year replaces the two-volume combination of the *Yearbook* and its complementary supplement, the *Statistical Appendix*.

During the year the Bureau received and made available to the public about 3,100 consular reports; many of these were collated for use in monthly compendiums: *Mineral Trade Notes*, *International Coal Trade*, and *International Petroleum Trade*. The Bureau's foreign-mineral specialist acted as advisor to many American consular officers stationed in Europe, and supplied information to the Bureau on the status of the mineral industries in a number of countries, relaying information obtained in personal visits.

Catastrophes, as the destruction of the *Hindenburg* and the New London (Tex.) schoolhouse disaster were followed by calls for technical advice; Bureau experts on explosions, helium, natural gas, and safety collaborated in making exhaustive studies and determining the cause of the New London explosion. In consequence, other localities

have asked the Bureau to examine schoolhouses and other public buildings to judge whether explosion hazards existed and to suggest remedies.

Explosions in the coal-mining industry have grown so infrequent that during the year it was necessary to stage "artificial" explosions in the Bureau's Experimental mine so that safety engineers could be given some experience in coping with conditions accompanying actual disasters. When this is contrasted with the years immediately preceding the creation of the Bureau of Mines, when there were 17 disasters, on an average, each year, causing 562 fatalities, the past fiscal year's record of 6 major disasters causing 56 deaths in all represents a tremendous and encouraging improvement.

Training courses conducted by the Bureau of Mines that not only teach men how to treat injuries but what to do in emergencies, inspections and recommendations for improvement of practices at mines, first-aid meets, and other means of promoting education in safety among the 2,000,000 employees of the mining industry have contributed largely to the conservation of our national resources, not only in the sense of preventing economic waste and loss in consequence of destructive fires and explosions but also in the preservation of life and prevention of human suffering.

FUTURE NEEDS

A more detailed review of the past year's work will be found on succeeding pages. However, due to limitations of available funds, the Bureau of necessity was forced to restrict the scope of some of the studies there described and has been unable even to initiate many other important and highly commendable investigations designed to improve health conditions, increase safety, promote efficiency, foster economic development, or conserve resources in the mineral industries. The Bureau believes that it can render worth-while service if funds are provided for conducting the work outlined in the following brief summary of principal needs.

The Bureau's data on the properties of coal have been of great use to the National Bituminous Coal Commission in the proper classification of coals as a basis for price fixing, and to other Government agencies as a guide in the economical purchase of coal for their own use. Because the analyses now on file unfortunately do not cover most of the various coal fields adequately, complete surveys similar to those conducted recently in Alabama and Washington should be made in all of the other fields.

Accidents caused by falls of roof and coal are responsible for approximately one-half of the deaths and a large proportion of the injuries now occurring in coal mines. Moreover, the behavior of the mine roof, as influenced by the nature of the strata and method of mining, affects

appreciably the percentage of coal recovery. Investigation of this problem of roof behavior would produce advantageous results in increased safety and prevention of waste.

The amount of harmful sulphurous gases emitted into the atmosphere varies considerably with different types of coal-burning power-plant equipment and different operating conditions. A field survey should be made to determine the variations, and a laboratory investigation should be conducted to determine the allowable limitations.

There is an increasing demand which the Bureau is unable to meet for research in fundamental mining problems, such as seismic investigations of rock vibrations caused by blasting and the vibration rate of rocks under stress; mine ventilation; and elimination or control of dust produced during mining operations.

The mechanization of coal mines has proceeded so rapidly during the past few years that additional personnel is needed to determine the safety and "permissibility" of the electrical and mechanical equipment being used.

Additional personnel is also needed to meet the widespread demand for reports on mining and milling methods and costs, to keep abreast of improvements in mining technology, and to aid small-scale operators and prospectors through technical reports, mineral-industries surveys, and personal visits by Bureau field engineers.

The number of nonmetallic minerals is so great, and the variety of things that might be done with them by using cheap electric power is so numerous, that a study of the processes using hydroelectric power in preparing them for market is urgently needed, especially in view of the Government's interest in a number of projects where such power is available.

There is also need for facilities with which to develop laboratory metallurgical processes devised by the Bureau to the pilot-plant scale of operations. This would make it possible to demonstrate commercial applicability of the processes and thus provide an incentive for their adoption by industry. The laboratory process using sound waves to precipitate solids from smelter fumes or smoke from chimneys is a case in point.

The petroleum industry and regulatory bodies realize that the difficult problem of oil and gas well spacing is one of major importance. Information as to how wells should be spaced to assure maximum recovery through prolonged flowing life is far from complete. A thorough, unbiased study of present-day conditions would aid greatly in conserving and prolonging the life of the Nation's oil supply by showing the fallacies of ruthless offset drilling.

As new oil reserves are sought in deeper reservoir rocks the cost of removing the oil becomes excessive unless full use is made of the energy of the high-pressure gas associated with the oil. As an aid in the solu-

tion of this increasingly serious problem, factual data as to quantities of oil now left in the ground, better utilization of available gas energy, recycling of gas, and storage of gas in partly depleted fields should be collected and widely published.

Results of the survey of crude oil storage made during the past year show that further technical studies are needed on the physical and chemical properties of various types of crude petroleum if data obtained in the survey are to be used advantageously to obtain optimum refinery yields of required products. Equally important is the collection of statistical information regarding underground reserves so that relationships may be established between desirable volume of oil in storage above ground and the rate at which oil can be produced from underground reserves when a sudden demand arises.

To meet an increase in the demand for helium that will ensue when legislation is enacted permitting the sale of helium to commercial aviation companies and for medical use, two additional wells should be drilled in the Government-owned helium-bearing structure at Cliffside, and one of the existing wells, which is in faulty mechanical condition, should be repaired.

To find nonmetallic minerals that will be acceptable to the trade it frequently is the practice to seek desposits of satisfactory minerals at a great distance, or even abroad, when material near at hand might be available if purified or properly treated. Tests by the Bureau in a number of instances have developed such purification or treatment processes, but the field is so large that additional personnel and equipment, particularly in the new experiment station at College Park, Md., are urgently needed if the growing demand for this work is to be met.

Recent disasters have resulted in many requests to the Bureau for information and aid in overcoming hazards due to accumulations of explosive gas and vapor, which cannot be complied with by the present staff.

State regulations that demand a limitation on the amount of fumes emitted by explosives used in mining have created a need for additional research on the production of poisonous gases by all the classes, grades, and sizes of industrial explosives used underground.

The present highly competitive situation in the coal industry makes production of the maximum amount of lump coal imperative. The "cushioned blasting" method has been proposed as a means for attaining this end. The Bureau has been asked for an opinion as to the safety of this method but is not in a position to render one because funds are not available for the necessary investigation.

The use of Diesel engines on mine locomotives offers a means of avoiding recognized hazards that result from the use of trolley locomotives in coal mines, but the possibility of introducing other hazards,

from carbon monoxide in the exhaust gas or from flame or sparks emitted by Diesel engines, has not been determined. The Bureau has been requested to investigate this matter, but has been unable to do so for lack of personnel.

In the transfer from the Bureau of Mines to the National Bituminous Coal Commission of funds and personnel formerly employed by the Bureau in work on bituminous coal, the fact was apparently overlooked that the Bureau also dealt with anthracite, coke, fuel briquets, lignite, peat, and international trade in coal. All of these still remain as Bureau functions but cannot be kept current by the force that can be maintained with the reduced funds. Much of the value of the economic information supplied to industry on these subjects lies in the promptness with which it is made available. Unless additional personnel is provided, important features will have to be postponed indefinitely or dropped entirely, and the completeness and continuity of statistical and other economic data to which the anthracite, coke, and other fuel industries are accustomed and entitled will be destroyed, to the material prejudice of their interests and those of the public as well.

Additional funds are needed to permit collection of data on interstate movements and distribution of gasoline and other finished petroleum products, which are essential to the studies and forecasts of market demand. These forecasts are invaluable to the petroleum industry, the several State regulatory bodies, and the Federal Government itself in the development of a sound program for oil conservation.

Outstanding achievements in mineral technology during the past 30 years have greatly changed the quantity of minerals that can ultimately be made available, have had a sharp effect upon competitive positions of different mining areas, and have reduced mining costs. In consequence, the Bureau of Mines is called upon constantly to advise mineral producers as to the amount of a specific mineral that can be produced economically or consumed at a specific price, and as to the effect of price fluctuation upon the stability of various branches of mining. In order to answer these questions, and to provide mineral producers with authentic price data for their guidance, new research must be undertaken to develop information on mineral prices comparable to that available in the fields of commerce, manufacturing, and agriculture.

The Bureau has been asked to continue on an annual basis the survey of iron and steel scrap consumption, which was originally made possible by funds provided by the Works Progress Administration and other cooperating agencies. Statistical and economic data on scrap is essential to the public interest, for it is gradually being realized that the stock of metals in use and the scrap returning to industry constitute a great national resource and that a thorough

understanding of the secondary-metal problem is vital to the formulation of any sound national policy with respect to raw-material supply.

There is a fast-growing recognition of the importance of nonmetallic minerals, but in perhaps no other field of mineral production is market research so necessary, because the value of the minerals is created by effective market demand; and in probably no other field has such research been so completely neglected by the Government, and by private agencies. Provision for additional personnel would enable the Bureau to undertake fundamental studies of consumption trends, marketing problems, and reviews of industries that would permit intelligent analysis of industrial needs and thus promote better utilization of the Nation's vast reserves of nonmetallic minerals.

Additional personnel is also needed to review and prepare for publication the constantly increasing volume of information and data on mineral commodities received from abroad, and to conduct regional studies of the mineral industries in the more important foreign countries.

The Mine Inspectors' Institute of America in a formal resolution has asked the Bureau of Mines to maintain facilities at the Experimental mine for creating controllable mine fires and other disaster conditions in order that theoretically trained key men may obtain actual experience in mine rescue and recovery work and thus be equipped to serve as leaders when real emergencies arise. Additional funds are needed for personnel and expenses of such work.

The demand for first-aid training is greater than at any other time in the history of the Bureau because of the demonstrated value of this work as an effective method of preventing accidents. There is good reason to believe that if the funds available for this work were doubled the accident occurrence in American mines would be reduced at least 50 percent within the next 5 years. Additional personnel is also needed to meet the demand for accident-prevention education for mine officials and safety workers, which represents the best defense of the operating companies against the mounting costs of accident compensation.

The increasing pollution of streams, due to mineral substances that are injurious or a menace to health, creates the need for a study of these pollutions to determine a means of controlling or removing them. There is also a need for resuming the study, in cooperation with the United States Public Health Service, of health and sanitary conditions in mining communities, which was recessed several years ago.

The seriousness of the dust-health problem in mining has created an urgent demand for field studies in coal, metal, and nonmetallic mineral mines to determine what can be done to protect the mine worker from the menace of this occupational disease, to help the employer protect himself from the heavy expense it causes, and to save

the general public from the costs of charity or relief that are often consequent.

A study of air conditioning in mines should be made to determine means for preventing hot, humid, and frequently dust-laden air which is the cause of much ill health, inefficiency, and accident occurrence, particularly in deep metal mines.

REVIEW OF THE YEAR'S WORK

During the fiscal year 1937, the work of the Bureau of Mines was administered under the Technologic, Economics and Statistics, Health and Safety, and Administrative Branches from offices in Washington, but most of the activities were conducted in mining districts throughout the entire country. Fourteen experiment stations (at Bartlesville, Okla.; Berkeley, Calif.; Boulder City, Nev.; College Park, Md.; Laramie, Wyo.; Minneapolis, Minn.; New Brunswick, N. J.; Pittsburgh, Pa.; Reno, Nev.; Rolla, Mo.; Salt Lake City, Utah; Seattle, Wash.; Tucson, Ariz.; and Tuscaloosa, Ala.) studied problems connected with mining, utilization, and conservation of the Nation's mineral resources in their localities, a number of field offices were assigned special duties, and the safety instructors moved on a flexible schedule, visiting mining establishments on request.

TECHNOLOGIC BRANCH

The Technologic Branch, which conducted research and technologic investigations covering all phases of the mining industry, included the Coal, Mining, Metallurgical, Petroleum and Natural Gas, Nonmetals, and Explosives Division.

COAL DIVISION

The Coal Division, formerly called the Mechanical Division, studied the properties, preparation, and utilization of coal, acted as consultant in the purchase and use of fuel by the Government, and operated the Bureau's coal-hydrogenation plant and Experimental mine.

Coal carbonization.—Carbonization tests to determine gas and coke-making properties have been completed on 50 typical American coals, including one noncoking subbituminous coal from Colorado. The results to date have been correlated with the proximate analyses, and relationships have been found that permit reasonably good estimation of the yield of coke, gas, and byproducts for a given coal from its proximate analysis.

Laboratory equipment designed for studying the expanding properties of coking coals was used to determine the expanding or contracting properties of various coals and blends of coals. This infor-

mation is of great value to coke-oven operators in helping to avoid destruction of ovens by expanding mixtures of coal.

A comprehensive study of the properties of coking coal indicated that the structure of the coke from very plastic coals is improved by mild oxidation.

Coal analysis.—During the year, 7,712 coal analyses were added to the Bureau's already voluminous records, which are available to Federal agencies as well as to the public to aid in purchasing solid fuels. Two especially equipped coal-sampling trucks collected 701 samples at 147 mines in 4 States; a special survey was made of 47 mines in Alabama.

Miscellaneous analyses.—Laboratory distillation tests to determine yields of gas, coke, and byproducts were made on 46 typical coals from various States, including a special survey of 28 samples from Alabama

Carborundum has been found to be a suitable inert material for mixing with coal in the Bureau of Mines agglutinating-value test for determining the caking properties of coals. This material is readily available on the market, and different lots have uniform surface characteristics and give similar results with the same coal.

Physical chemistry.—Completion of another series of experiments on the rate and mechanism of the thermal decomposition of ethane has provided more fundamental data for further development of the new gas-polymerization theory, which is reducing greatly the quantity of natural and refinery gases heretofore lost.

Coal preparation.—Gradual improvement is taking place in the coal fields where washing has been adopted. Bureau experts kept in touch with the operators and unobtrusively pointed out various inefficient and wasteful practices until they were corrected. Studies were made on decreasing the cost of drying washed coal. In the past year the Bureau made an intensive study of the coagulation of silt from washery waste waters so that the latter will cease to be obnoxious in streams. Better and cheaper coagulants are in prospect.

Use of fuels.—The investigation of the effect on combustion of treating coal with small amounts of chemicals has been completed, and the results have been prepared for publication as a bulletin, now in press. Data assembled during studies on the relation of ash composition to the formation of clinker and slag have been found of value in connection with the operation both of industrial furnaces and small domestic stokers.

Fuel economy service.—The fuel costs at Government power and heating plants have been decreased in consequence of recommendations made after efficiency tests to determine fuels and equipment. Feed-water conditioning service was continued, with marked improvement in economy and safety of boiler operation. A handbook for

operators of fuel-burning equipment was published, and advice on smoke abatement was given to the public and to the officials of certain cities.

Coal hydrogenation.—The new continuous hydrogenation plant at the Pittsburgh Experiment Station was completed recently and has been operated six times in tests lasting 10 to 24 hours. Pittsburgh-bed coal was liquefied at 420° C. and 3,000 pounds hydrogen pressure. The hydrogen was produced from natural gas and steam by a process developed by the Bureau. New methods have been developed for determining the composition of tar and oil from the hydrogenated coal, and analyses of neutral oils have been improved by successive extractions with increasing concentrations of sulphuric acid. With the completion of the plant, the Bureau is prepared to conduct comprehensive studies on the composition and properties of the various kinds of American coals, as they affect the utilization of these coals for combustion, carbonization, gasification, and liquefaction.

Experimental coal mine.—Studies of the bearing strength of potash salt from the mines near Carlsbad, N. Mex., conducted in the Bureau's Experimental mine at Bruceton, Pa., indicated that if proper mining methods are pursued under careful control there is little danger of sudden shearing breaks of the roof that might admit water and cause loss of the mines.

After mine explosions in Colorado and Pennsylvania the explosibility of coal dusts from the districts concerned was determined by tests in the Experimental mine, and the rock-dusting requirements for mines working these coals are now accurately known.

MINING DIVISION

The Mining Division continued its investigation of metal-, non-metal-, and coal-mining methods and mine ventilation, extended the mineral-industries survey, and tested and inspected electrical equipment for "permissibility" in mines.

Metal-mining methods.—The investigation of metal-mining methods comprised a detailed field study of mining and milling methods and costs, with reports thereon; a part of the mineral-industries survey; and technical assistance to small operators and prospectors. Field work was continued throughout the year in nine Western States. Ten information circulars were published, including four contributions to the mineral-industries survey; in addition, manuscripts for a comprehensive bulletin Copper Mining in North America, and 15 information circulars were completed and are ready for publication. Field engineers gave technical assistance to numerous prospectors and small-scale mine operators who obviously were unable to employ competent consultants.

Metal-mining research.—Facilities for independent research on the fundamentals of mining practice were established during the year when a testing adit was driven 300 feet on the Government reservation at Mount Weather, Va., and completely equipped for the purpose. Previously the work was limited to investigations of improved metal-mining practices developed at individual mines by operators. A research program was set up, comprising rock-drilling tests with various kinds of steel and steel alloys and with different types of bits; ventilation studies; explosives investigations, including production of noxious gases in blasting; research on the formation, means of elimination, or control of dust production in mining; development of apparatus and technique for determining the strength and predicting the failure of mine roofs and pillars; and related problems.

During an investigation of rock-drilling practices a national survey of metal mines was made, from which an empirical index for the use of detachable bits was derived. A comprehensive technical survey was made of the use of mechanical loaders in metal mines, and an analytical report thereon was partly completed. Four information circulars were published.

Nonmetal mining.—Studies of mining and preparation methods and costs were conducted at 28 mineral-wool plants, 5 clay mines, 2 gypsum mines, and 1 silica-sand plant. Screen tests were made at four rock quarries to determine the relation between size gradation of primary crusher feed and size gradation and shape of the products. A new technique was developed for measuring vibrations caused by blasting in quarries and their effect on artificial structures; to determine the characteristics of ground vibration from quarry blasts and the effect of various charges and kinds of explosives, and tamped and untamped charges, 125 field tests were made in 19 quarries and 1 mine.

Seven information circulars and one report of investigations were published. Three papers were completed for publication in the technical press or by technical societies, and five manuscripts were completed and are ready for publication as information circulars.

Coal mining.—Studies were begun on multiple-shaft mechanized mining in coal mines to develop data designed to increase efficiency and promote safety and conservation in coal mining. An information circular, *Mining Methods Used in the Grundy Coal Field of Buchanan County, Va.*, was published. Field studies were completed and manuscripts prepared on *Shaft-Bottom Lay-Outs in Coal Mines*, and *Some Aspects on Strip-Mining of Bituminous Coal in the Central and South Central States*; both await publication.

Mine ventilation.—An investigation of causes, behavior, and control of anthracite mine fires was continued throughout the year; a preliminary report was prepared and discussed with the cooperating mine officials. The results developed by laboratory research were applied

to a particular fire, for which a complete history is being obtained. Material was assembled as a basis for a report on the present status of mechanical cooling in mines and the limits of its economical application to the mines in the United States.

Mineral-industries survey.—A field examination of the noted Mojave gold-mining district, Kern County, Calif., was completed, and an information circular, *The Golden Queen and Other Mines of the Mojave District, California*, was published. A study of the mineral industry in the southern Mother Lode counties of California was undertaken. The survey of Calaveras County was 60 percent complete, and a report thereon is in preparation. Tuolumne and Mariposa Counties, also in California, have also been studied in part and will be covered in separate reports.

Electrical equipment.—Inspection and tests for permissibility under Bureau of Mines schedules, conducted in the electrical laboratories at the Pittsburgh Experiment Station, resulted in formal approval of 9 coal-cutting machines, 13 coal loaders and conveyors, 1 drill, 3 storage-battery locomotives, and 2 electric cap lamps. Four motors, three starters, and one headlight were found suitable for use in permissible outfits, and over 600 changes in design of permissible compartments were reviewed and approved. Nearly 700 persons witnessed demonstrations of electrical ignition of gas-and-air mixtures by the staff of the section in a campaign to impress on the mining public the hazards of faulty electrical equipment and improper installation. Problems relating to the voltage of mine circuits, installation of transformers underground, and cables in roadways, shafts, and slopes were studied. Six reports of investigations, three information circulars, and two schedules were published during the year.

METALLURGICAL DIVISION

The Metallurgical Division conducted investigations on the treatment of mineral raw materials from the condition as mined to the finished product, starting with highly theoretical implications, working logically through laboratory development of new methods, and concluding with plant testing to the point of demonstrative practical application. This procedure provides incentive for the establishment of new industries; examples of recent new commercial operations based on results obtained by the Division are the installation of a flotation unit to treat scheelite and slimes and the construction of a mill to separate talc and magnesite by flotation.

Metallurgical fundamentals.—Selenium glass, selenium crystals, tellurium, and one form of calcium hemihydrate were investigated by low-temperature specific-heat measurements for the first time in history. When further thermodynamic data on the calcium sulphate hydrates have been obtained, they will permit an understanding of the

present unsatisfactory behavior of some lots of carefully prepared plaster and will provide information that should insure a uniform and superior product.

A study was made and a manuscript prepared on the thermodynamic properties of metallic carbides and nitrides. Consideration of the data offers a satisfactory insight regarding the theoretical basis for the use of calcium carbide in debismuthizing lead bullion, the gaseous case-hardening of ferrous materials, the direct synthesis of ammonia from methane and air, the behavior of manganese in mild steels, and the synthetic production of cyanide from ammonia and carbon monoxide.

Preliminary experiments indicated that a cyclic process for removing hydrogen chloride from the hydrogen used in the reduction of chromium chlorides by active carbon—a step in the production of chromium from ores by the new process developed in the Division—will operate effectively. The possibility of producing chemically pure chromium for somewhat less than 20 cents per pound appears to be good.

A small experimental demonstration unit was evolved which operated with an efficiency of 85 to 95 percent of the theoretically maximum possible concentration for the separation of gases of different density or molecular weight by diffusion. More than 400 tests have confirmed the belief that this device, which provides a mechanical means for separating gases in a manner just as simple as the conventional separation of mineral particles by gravitational methods, may be converted into a new tool for the metallurgist or chemist applicable to a wide variety of technical processes.

Papers were published during the year as follows: A Revision of the Entropies of Inorganic Substances; Heats of Fusion of Inorganic Substances; Sponge-Iron Experiments at Mococo; Reduction of Zinc Ores by Natural Gas; Chemistry of Anhydrous Chromium Chlorides; The Thermodynamic Properties of Sulphur and Its Inorganic Compounds; and The Thermodynamic Properties of Metal Carbides and Nitrides.

Metallurgy of steel.—Special equipment for determining magnetic susceptibility at elevated temperatures and a vacuum furnace capable of operating at 1,300° C. were developed, constructed, and operated in the course of a study of the constituents of open-hearth slags of various types.

Blast-furnace studies.—As a step in assisting steel manufacturers to meet the very rigid requirements demanded by consumers, investigations were made on removal of the maximum amount of sulphur and other impurities in the blast furnace. It has been found that the oxides in basic pig iron bear no direct relation to those in the basic open-hearth steel produced from it, but that there is a definite relation be-

tween the silicon and sulphur content and the temperature of iron in the runner.

Special studies.—The most spectacular achievement of the division during the year was the devising of apparatus for applying high-frequency standing sound waves to the flocculation and removal of dust and smoke from gaseous suspensions. This process appears to have good possibilities for the solution of these problems and only awaits a practical method for the production of suitable standing waves. The various factors that control the flocculation and removal of dust, smoke, and fume from gaseous suspensions by high-frequency sound waves were studied with three types of laboratory machines, constructed and operated on various aerosols. This method has aroused the interest of a wide variety of industries that desire to recover valuable products that now are wasted up the stack and of communities that must handle the problem of preventing air pollution. A description of these machines and their operation has been published.

Ore-dressing.—Grinding studies were continued, and the results described in the following publications: Ball-Mill Grinding; Relation of Ball Wear to Power in Ball Milling; Observations from Some Crushing and Grinding Tests; Analogy Between Size-Analysis of Droplets in Emulsions and Particles in Crushed Ore; and Use of the Coercimeter in the Study of Grinding.

Some success was achieved in magnetic-roasting studies, in investigations on the chemistry of flotation, and in tests of new flotation reagents. Data obtained on the flotation of nonsulphides were published in three papers—Flotation of Complex Molybdenum-Vanadium Ores, Flotation of Vermont Talc-Magnesite Ores, and Flotation of Langbeinite.

Precious metals.—Results of an investigation of the recovery of tungsten from slimes previously wasted has resulted in the commercial installation of a 75-ton flotation plant, which is recovering more than 91 percent of the tungsten.

A paper was published giving the findings of a preliminary investigation on the loss of gold in dredging and its prevention.

Nonferrous metallurgy.—A method was devised for recovering lead and silver from oxidized siliceous ores that resisted attack by usual ore-dressing routines. By grinding with iron balls, the lead becomes metalized and can be removed by gravity treatment or flotation, and the silver becomes associated with finely divided abraded iron and can be separated magnetically or floated with the lead. Two papers, entitled "Smelting in the Lead Blast Furnace" and "Treating Drosses in Lead Smelters", were prepared for publication.

Ore-testing.—Work was actively continued on the standardization of testing methods, the development of new methods of analysis, and the determination of recommended processes for the treatment of

representative ores from various mining districts. Results of the work are published yearly as a progress report of the division.

Electrometallurgy.—Plant-scale furnaces and testing equipment were installed in the Boulder City Experiment Station, and active work was done on the development of methods to use surplus power for treating ores that should promote the establishment of new industries, in the vicinity of large western dams.

Methods of purifying solutions used in a cyclic process in which manganese is recovered by electrolysis from the treatment of low-grade ores were perfected, and production of metallic manganese progressed on a moderate scale.

PETROLEUM AND NATURAL-GAS DIVISION

The Petroleum and Natural Gas Division studied technical and engineering problems relating to the production, recovery, and transportation of oil and natural gas and the refining and storage of crude oils. It also operated a helium-production plant at Amarillo, Tex.

Production and recovery of petroleum and natural gas.—The spacing of wells so that oil is drained from a producing formation with greatest efficiency and economy is one of the most important, complex problems of the petroleum industry. As a contribution to the solution of this problem, engineers of the Division have established an empirical relation between the mass rate of fluid production (gas, oil, and water) and the drop in pressure in the producing formation.

That the Division's research activities are yielding practical benefits is shown by the special reports on producing oil and gas fields that have been made by the Bureau upon request of operators desiring to conserve and utilize efficiently the energy in naturally producing structures and of Government organizations concerned with regulation of oil and gas production in various States. During the current year, data reports were made by Bureau engineers on the Fitts pool (Oklahoma), the Tepetate oil field (Louisiana), and the Laredo and Otis fields (Kansas), which aided the oil companies in controlling and the authorities in regulating oil and gas production in these fields by supplying needed information from a competent, unbiased source on conditions in the producing formations that affect efficient and economical rates of withdrawal from the natural underground reservoirs.

Transportation of natural gas.—Another example of cooperative work is the study of freezing in natural-gas pipe lines. This study, which is being conducted in cooperation with the natural-gas department of the American Gas Association, relates to the conditions under which hydrocarbon hydrates are formed in pipe lines containing natural gas under high pressure, with a view of devising means of preventing them. During the year an apparatus for determining the

dew point of gases under pressure was constructed, and it is believed that better understanding of dew-point determinations—an essential consideration—will be obtained.

Engineering field studies.—Engineering reports on the Big Spring and other West Texas fields and on the Oklahoma City oil field were compiled. Results of studies of gas reserves in the Oklahoma City oil field and in the Michigan “stray” sands were published.

Special engineering problems.—Three reports on brine disposal in oil fields, one on results of oxidation of oil in place due to repressuring oil-producing formations with air and air-gas mixtures, and one discussing causes and prevention of blow-outs during drilling were issued. An information circular prepared jointly by this division and the Health and Safety Branch covered some problems of respiratory protection in the petroleum industry, with suggestions for their solution. An ingenious method for determining compressibility of natural gas was described in a paper published in a technical journal.

Chemistry and refining of petroleum.—The second and third gasoline-survey reports in cooperation with the Cooperative Fuel Research Committee were published. This series is to continue during the coming year. A report giving analyses of crude oils from some Michigan fields attracted unusual attention. Two papers were printed in a technical journal reporting results of experiments on determination of so-called molecular weights of petroleum fractions of relatively large molecular weight. An apparatus and method for continuous isothermal separation of the major fractions of petroleum were developed, and the application of the principle to a routine method of analysis of crude petroleum was studied.

Crude-oil stock survey.—At the request of the Interstate Oil Compact Commission and pursuant to a special Congressional appropriation a quantitative and qualitative survey of all crude petroleum in storage in the United States was made. The need and purpose of this survey were based upon the possibility that crude oil held in storage for many years had lost much of its gasoline content. The physical condition of the crude oil in storage was considered by the Commission an essential factor in forecasting demand for petroleum from the standpoint of equitable balance between demand and quantity of oil in storage. A preliminary report of results and conclusions was made at a meeting of the Commission at Santa Fe, N. Mex., July 10, 1937.

Helium plant.—The helium production of the Amarillo plant was increased to 4,800,000 cubic feet; it was taken by the Army and Navy for use as a lifting agent for nonrigid airships. The Bureau also supplied about 8,000 cubic feet of helium to the United States Public Health Service, which is cooperating with hospitals in the use of helium mixed with oxygen in treating asthma and other respiratory diseases.

Other activities.—Two engineers from the petroleum field office, Dallas, Tex., cooperated with two engineers of the Bureau's Safety Division in investigating the causes of an explosion of natural gas used to heat the consolidated school buildings at New London, Tex. Conclusions and recommendations to prevent future occurrence of such catastrophes were embodied in a report for publication.

As a result of the burning of the German airship *Hindenburg*, the division was called upon for advice and technical data regarding the use of helium in dirigibles.

A comprehensive report on petroleum and natural-gas conservation was prepared for the Third World Power Conference.

NONMETALS DIVISION

The work of the Nonmetals Division was concerned with the beneficiation, processing, and utilization of nonmetallic mineral substances, and with fundamental studies, such as embrittlement of boiler steel and the application of new research tools.

Potential increase in supply of lithium salts.—Demands for larger supplies of cheaper lithium salts are now answerable; the division's study of concentration methods for low-grade spodumene ores and its chloride-volatilization process for extracting the lithium from spodumene in the form of lithium chloride point the way to increase production at low cost. Research on application of beta spodumene concentrate in pottery and glassmaking has been accelerated in consequence.

Improving quality of talc.—Froth flotation for the treatment of talcs is also being applied commercially. Last year magnesite was removed from a Vermont talc and this year tremolite was separated from a New York talc by flotation methods. In this latter instance it is desirable merely to control the ratio of talc to tremolite in talcs intended for use in ceramics. Pure talc is needed for the higher-grade uses, such as in cosmetics and special porcelains.

Hydration of lime.—Studies of the hydration of limes show the importance of controlling hydrating temperature, as reflected in the behavior of hydrated lime. Sufficient plasticity to class many limes as finishing lime is obtained if enough care is taken to hydrate completely most of the magnesia present.

Concentration of kyanite.—Samples of kyanite from large, low-grade deposits in all parts of the Nation were under investigation, and more are to be collected. Froth-flotation and agglomerate-tabling methods, using the more modern cationic and anionic reagents as collectors, have proved most successful so far; however, the impurities in kyanite deposits vary in character and dispersion, and not all the concentration problems have been solved.

Treatment of clays.—Tests on fractionation of clay by froth flotation were made at the Tuscaloosa laboratory. It would appear that the process can be used with advantage to remove the colloidal fraction of the clay first of all. This is done without any mineral selection, which is obtainable only on the more granular fractions of clays. Removal of mica, feldspar, and quartz from clay seems to be in sight. There are thousands of clays, no two alike, and the field of research is far larger than the force available to investigate it.

Studies of the olivine obtainable in dunities of the Pacific Northwest have shown that they are of unusual refractory grade; therefore, their adaptability to various uses was investigated. Similar encouraging results were obtained with the chromites of the same region. The soapstone of the Northwest has been tested for several years and is now actively developed commercially. Studies of the effect of structure of the soapstone shapes on firing behavior were made during the year.

Seasoning of cement.—The work of the division on the possibility of substituting anhydrite for gypsum as a retarder for portland cement was finished. The amount of anhydrite that can be substituted is a function of the condition of the cement clinker, especially the water vapor that has been absorbed from gases at the proper temperature.

Studies of particle size.—A mathematical law of size distribution in crushed materials was derived and tested on numerous minerals; from it can be deduced such important constants as total area per unit weight, number of particles, and uniformity of coefficient.

Boiler-water studies.—One of the outstanding results attained by the division during the year concerned treatment of boiler feed-water in connection with research on causes and mitigation of "embrittlement" cracking of boiler steel. Last year, silica dissolved in the caustic boiler water was found to be an important factor in the cracking of the steel. Since then, the presence of dissolved lead, titanium, antimony, and a few rare metals in the alkaline water has also been found very important, lead being particularly harmful. The addition of proper amounts of lignin or tannins, or their derivatives, affords the best protection against embrittlement. Studies of the mechanism of this cracking and its prevention are being continued.

New research tools.—Very successful application has been made of the newer cationic flotation reagents in separating feldspar and quartz, both by flotation methods and by table agglomeration. The coming year should see important adoption of these methods.

The quartz spectrograph as an instrument for quantitative chemical determinations has been diligently adapted to the analysis of silicate and carbonate rocks. These are fields of analytical chemistry where existing methods are long and tedious.

EXPLOSIVES DIVISION

The Explosives Division conducted research on the explosibility and inflammability of gases and vapors and tested explosives and blasting devices.

Gas explosions.—An important continuing problem is the development of information relating to the causes and elimination of gas explosions from accumulations in confined spaces. A member of the Division assisted in the investigation of the terrible school disaster at New London, Tex., and drew up recommendations for practice that should prevent other similar disasters. Since 1929, work done in cooperation with public utility companies in and near Boston, Mass., has reduced the explosibility of manhole atmospheres to about one-ninth that shown when the study was begun.

Inflammability of gases and vapors.—Fundamental studies of chemical compositions and related conditions governing the burning or explosion of gas were extended to certain organic compounds upon which data have not hitherto been available. A bulletin containing information available on the subject, for which the supply has been exhausted, is being revised to meet the continuing demand.

Detection and elimination of mine fires.—A chemical method was developed for locating incipient anthracite mine fires and for following the progress of those in inaccessible workings, together with much information on the behavior of anthracite and associated combustible material when subjected to heat. This study has proved useful in diagnosing the cause of such hazards and determining appropriate measures for minimizing them.

Mechanism of flame propagation.—Cooperative studies have developed many important kinetic considerations involved in the propagation of flames and explosions.

Methods of testing explosives.—Many striking phenomena were noted in the study of variables governing the ignition of gassy atmospheres by explosives. The danger zones in the spaces near boreholes were mapped. Evidence was accumulated to show that unusual concentrations of energy in the products of detonation may cause dangerous ignitions.

Permissible explosives and blasting devices.—To simulate severe service under dangerous gas or gas-plus-dust conditions, 1,254 tests were made within the Bureau's testing gallery; 1,280 other important control tests of a physical or performance character were conducted, and 195 explosives were analyzed chemically. The active permissible list of explosives at the end of the fiscal year comprised 195 brand names, and the list of blasting devices included 8 models.

OFFICE OF CHIEF MINING ENGINEER

The Chief Mining Engineer acted as liaison officer in international cooperation in mine-safety research, served as chairman of the Bureau's Mine Safety Board, and investigated special problems relating to mining.

International cooperation in mine-safety research.—Interchange of quarterly progress reports and data with the research stations of Great Britain, Belgium, France, and Germany was continued. A conference at the Pittsburgh Experiment Station with representatives of the British Safety in Mines Research Board who had attended the Third World Power Conference was devoted to discussion of problems concerning gases, harmful dusts, and dust explosions. Demonstration coal-dust explosions were made at the Experimental mine.

Mine Safety Board.—The Mine Safety Board continued regular meetings and reviewed reports on mine accidents. Although no new recommendatory safety decisions were made during the year, a number were under consideration. Schedules of explosives were studied, with especial reference to emission of fumes. Data were obtained on a liquid-oxygen explosive disaster in France and a serious explosion in an open-cut mine in Chile. A revision of the circular citing all Safety Board decisions, with explanatory text, was prepared and submitted for publication.

Ground Movement and subsidence in mining.—Studies on ground movement and subsidence were continued by the American Institute of Mining and Metallurgical Engineers committee which cooperates with the Bureau. The chief mining engineer, as chairman of the committee, prepared a review of the studies of the committee since it was formed in 1923. Studies on prevention of coal-mine bumps, such as occur in eastern Kentucky, were continued, and recommendations by the chief mining engineer were followed with success.

Conservation of potash salt in mining.—Investigations were made in June 1936 in mines on Government lands at Carlsbad, N. Mex., with a view to reducing the loss of potash salt by changing the mining method. Blocks of potash salt from these mines were tested later in a compression machine at the experimental mine.

Diesel mine locomotives.—Diesel locomotives have not yet been used in American mines, but it is believed that they are safer for coal mines than trolley locomotives. The study of their use in Germany, France, and England was continued, additional data were obtained by correspondence, and a report was published as Information Circular 3320.

Experimental mine tests.—A report on coal-dust tests in the experimental mine since 1932 was in preparation, to be published as one of a series of bulletins on the subject. A review of a quarter

century of successful tests in the experimental mine, which have shown that major mine explosions are preventable by rock dusting, was completed.

European mining methods.—A bulletin covering data on European mining methods obtained on trips abroad was being prepared for publication.

ECONOMIC AND STATISTICS BRANCH

The Economics and Statistics Branch assembled and published data on the production and consumption of mineral commodities and prepared reports of special economic studies; it also was responsible for the annual publication entitled "Minerals Yearbook." The Branch comprised the Coal Economics, Petroleum Economics, Mineral Production and Economics, Metal Economics, Nonmetal Economics, and Foreign Minerals Divisions.

COAL ECONOMICS DIVISION

The work of the Coal Economics Division concerned itself with statistical and economic problems relating to the solid-fuel industries.

Service to industry.—The division procured statistics and studied economic trends with respect to anthracite, bituminous coal, lignite, peat, coke, and fuel briquets. As a service to producers, distributors, and consumers the division issued weekly and monthly reports that reviewed short-time movements of supply and demand; many of these data were summarized in annual reports for Minerals Yearbook that provide a background for current service and trace basis changes in the coal and related industries.

Special investigations.—A detailed and historical study of unemployment in coal mines, undertaken in cooperation with the Works Progress Administration, was practically completed during the year. Data regarding expenditures for supplies and materials, colliery fuel, purchased electric power, and salaries and wages in bituminous-coal and anthracite mines in 1935, collected in cooperation with the Bureau of the Census as a feature of the Census of Business, were prepared for publication. Special reports were also completed on the mechanical mining and cleaning of bituminous coal and anthracite, the conservation of coal resources, technology and the mineral industries, and mechanical loading in metal and nonmetal mines.

International trade in fuels.—The monthly report on international coal trade included special studies of coal-market control abroad and trends of the American coal market in Canada. A separate publication on competitive conditions in the international coal trade was released.

Economies in publication.—The collection of statistical reports through trade agencies, inaugurated several years ago to reduce costs, was continued in the fiscal year 1937.

PETROLEUM ECONOMICS DIVISION

The Petroleum Economics Division collected statistics on petroleum and natural gas, prepared monthly forecasts of demand for petroleum products, made special studies of crude-oil stocks and of factors affecting productivity in the oil and gas industry.

Forecasts of demand.—The monthly forecasts of demand for motor fuel and crude oil were a major feature of the work of the division during the year. These forecasts have been issued regularly by the Bureau since June 1935, and they represent an impartial projection of the trends of current demand. They constitute a useful service, essential to the information of the petroleum industry, of the several State agencies, and of the Federal Government itself in developing a sound oil-conservation program. Enlargement of the staff engaged in collecting the necessary basic statistical data has resulted in progressive improvement in the scope and accuracy of the forecasts during the past year.

Survey of crude-oil stocks.—One of the most important objectives of oil conservation is to avoid the waste resulting from the unnecessary storage of oil above ground. At the request of the Interstate Oil Compact Commission, the Petroleum Economics Division in cooperation with the Petroleum and Natural-Gas Division of the Bureau undertook a survey of crude-oil stocks as of June 30, 1936. The main objectives of this survey were to determine the age and origin of crude held in storage, the extent of deterioration from the standpoint of straight-run gasoline production, and the relations between necessary working stocks and surplus reserves.

The economic results of the survey indicate the necessity for a continuous check of the liquidation of older stock accumulations in contrast to the changes in current or working stocks. The amount of older stocks desirable is directly related to the extent of underground reserves from which current production can be increased quickly. This segregation of older stocks will make possible an adequate check of the fluctuations of current stocks and their proper relation to market demand.

Special studies.—A survey in cooperation with the Bureau of the Census resulted in completion of a census of oil and gas production that had not been undertaken since 1919. A special study of factors affecting productivity in the oil and gas industry was undertaken by the division in cooperation with the Works Progress Administration, and the results indicate the great technical advances that have been made in the discovery, production, and refining of oil.

MINERAL PRODUCTION AND ECONOMICS DIVISION

The Mineral Production and Economics Division procured and published production statistics for metal mining, supervised the compilation of the Minerals Yearbook, continued statistical studies of

employment, accidents, and explosives, and assisted in a census of mines and quarries and in a study of technologic changes in the mineral industry.

Metal-mine statistics.—Following the Bureau of Mines policy of publishing production statistics as soon as possible after the close of the calendar year, the first of the preliminary reviews covering metal mining in the western States was released early in January, and by the end of the month summary reports covering the 13 States that produced nonferrous metals had been issued. By the end of June, statistics for metal mining were virtually completed, and the State mine-review chapters (except those for Arizona, Montana, and Nevada) in Minerals Yearbook 1937 contain final figures for 1936 as well as details for 1935 that were incomplete in the previous volume.

Minerals Yearbook.—Minerals Yearbook 1936 was issued in August 1936. The volume included 69 mineral-commodity chapters and comprised 1,136 pages, including a comprehensive index. The demand for this annual official review of the mining industry has grown rapidly in recent years, and nearly 10,000 copies of the 1936 volume were distributed. As with others of the series, orders for Minerals Yearbook 1936 had virtually exhausted the edition shortly after delivery by the printer.

The entire manuscript for Minerals Yearbook 1937 was submitted for transmittal to the Public Printer on June 22, 1937. This volume is substantially larger than its predecessors, for it includes detailed statistics on coal, petroleum, and certain other commodities previously published in the Statistical Appendix. Thus, for the first time in more than 30 years, a single volume contains complete data on the entire mining industry.

Employment and accidents.—The division conducted its usual statistical investigations of employment and accidents in the mining, quarrying, smelting, milling, and coking industries of the United States. Bulletins showed the progress made in promoting safety in the mineral industries. Four safety contests, based upon reports of accidents and man-hours of employment, were conducted during the year. The division also prepared and published reports covering the quantity of explosives produced in the United States and the amounts of nitrogen and other materials used in their manufacture.

Joint conduct of census of mines and quarries.—During the fiscal year 1936 a canvass of the mining industry for 1935 was conducted by the Bureau of Mines in cooperation with the Bureau of the Census. This work was undertaken with the advice of the Central Statistical Board, and questionnaires of the two Bureaus were consolidated into a single schedule. Returns have been received that are believed to be accurate enough to indicate the volume of employment as well as expenditures for supplies, salaries, and wages paid by the mineral

industries, but in no instance do they justify computation of unit costs. Detailed preliminary data for 1935 for most of the mineral fuels, metals, and nonmetals have been compiled and made public through the office of the Census of Business.

Changes in mineral technology and output per man.—In cooperation with the Works Progress Administration the division studied technological changes and output per man in selected mineral industries in the United States. Two reports were published, "Technology and the Mineral Industries" and "Small-Scale Placer Mines as a Source of Gold, Employment, and Livelihood in 1935." These initiate a series intended to show technological changes in the extractive industries and their effect on production and employment.

METAL ECONOMICS DIVISION

The Metal Economics Division was created July 1, 1936, to effect a more logical organization of the economic and statistical work in metals. The division also conducted special studies of the consumption of iron and steel scrap and tin.

Statistical reports.—Forty-five marketing and production canvasses of the metal industries were completed; the results were made available to the public promptly in 30 mineral market reports. Fifteen chapters were prepared for Minerals Yearbook 1937 by division specialists. Two information circulars were published, 3 articles were written for technical journals, and 32 large-scale charts depicting the international flow of minerals were prepared for printing. The division also compiled the metals section of Mineral Trade Notes. Over 2,000 requests for information from the public and from various Government agencies were answered during the year.

Consumption studies of iron and steel scrap and tin.—An outstanding accomplishment of the division during the year was the completion of the first comprehensive survey of the consumption of iron and steel scrap. The usefulness of this new service was attested by the wide publicity given to the Bureau's publications in trade journals, and the following statement from a spokesman of the scrap iron and steel industry.

For the first time in the history of the industry, an authoritative and reliable contribution to the literature of the scrap industry was made by the Bureau of Mines. * * * I would strongly urge the continuation of this survey as a necessary function of the Bureau of Mines, which, because of the respect earned by it from industry because of impartiality and thoroughness in its work, has been able to secure the complete cooperation of both the scrap industry and the steel industry.

The canvass of the uses of tin, discontinued in 1931, was resumed upon request from tin consumers. The new survey included secondary tin and complete data on plant inventories and the flow of scrap and other byproducts.

NONMETAL ECONOMICS DIVISION

The Nonmetal Economics Division is essentially a service organization supplying economic and statistical data on nonmetallic mineral commodities to a group of industries having a total annual production valued at more than \$600,000,000.

Statistical reports.—The statistical canvass and compilation of chapters for Minerals Yearbook is an important function of the division, which prepared 19 chapters for the 1937 volume, covering more than 80 commodities. These chapters reviewed the outstanding activities in each industry, and the statistical data were supplemented by a wealth of current information. Supplementing the yearbook chapters, monthly reports were issued on cement and quarterly reports on gypsum—compilations much appreciated and in active demand. Current statistical data were issued as mineral market reports giving preliminary estimates or advance final figures. Data were prepared for joint reports of the Census of Business, as well as for those on employment and productivity issued in cooperation with the Works Progress Administration.

Special studies.—Special reports covering significant economic features of the nonmetallic mineral industries included papers on trends in the use of various building materials, economic significance of high-grade concentrates, and economies resulting from the use of wire saws in working slate and building-stone. Other reports included an annotated bibliography of 450 references covering all work of the Bureau of Mines on building materials of mineral origin and a comprehensive bulletin describing all phases of the asbestos industry, with particular emphasis on foreign supplies and international trade. The division prepared a review of technical progress in the entire field of industrial (nonmetallic) minerals during 1936 for publication in an outside mining journal. Chapters on refractories, minor industrial minerals, and dimension stone were written for inclusion in a forthcoming volume on industrial minerals and rocks. Reports on the salt and gypsum industries were nearly completed.

Mineral trade notes.—The division continued the monthly publication of Mineral Trade Notes, the chief function of which is to present abstracts of consular reports. The circulation has increased steadily and has been supplemented by a loan service of consular reports and by the issuance of five special supplements. Intimate acquaintance with mineral developments in foreign countries is thus made possible.

Service work.—Hundreds of inquiries on mineral subjects were answered monthly; during the year these included requests from over 30 Government agencies. The marketing of minerals was promoted by furnishing inquirers with lists of buyers. Extensive data files, which are constantly augmented, furnished a reservoir of detailed informa-

tion. The series of information circulars built up during recent years was of great assistance, but many of them are out of print, and only loan copies could be supplied. The welfare of the nonmetallic mineral industries was promoted also by close cooperation of staff members with the activities of the American Institute of Mining and Metallurgical Engineers, particularly in establishing its Industrial Minerals Division, and in serving on the editorial board responsible for publication of a 700-page volume on industrial minerals.

FOREIGN MINERALS DIVISION

The Foreign Minerals Division completed the survey of the international flow of mineral raw materials, collaborated with American consular officers abroad in conducting mineral-economics surveys, and developed arrangements to make consular economic and commodity reports available to American industries.

Mineral raw-materials survey.—The survey of mineral production, distribution, and consumption of 32 minerals, preparation of which was begun in the fall of 1935, was completed in June 1937. This study covers in detail world occurrences of the 32 major industrial minerals and reviews the position as producer and consumer of these minerals held by the 12 major industrial countries. The finished volume comprises 342 pages of text, tables, and international flow charts and has been published by the McGraw-Hill Book Co., due to lack of adequate printing funds in the Bureau.

Foreign mineral specialist.—During the past fiscal year the Bureau's foreign mineral specialist, detailed as vice consul to European posts, has made comprehensive mineral-economics surveys of 10 European countries (Italy, Germany, Poland, Czechoslovakia, Bulgaria, Rumania, Austria, Hungary, Yugoslavia, and Greece). These studies were prepared in collaboration with American consular officers. Only 4 of the 14 major reports prepared by this specialist have been published, because of lack of funds. The material not as yet released is being prepared as a regional survey covering southeastern Europe, and it is anticipated that a report can be published during the coming fiscal year.

Consular reporting service.—During the year the division developed to a very satisfactory degree cooperative arrangements with the American consular service whereby the latter now furnishes the Bureau regularly with economic and commodity reports essential in the preparation of the three monthly bulletins covering international trade in minerals, petroleum, and coal and very helpful in the preparation of the various commodity chapters for Minerals Yearbook. During the past year the Bureau received approximately 3,100 consular reports all of which were used for current publications or made available for loan.

HEALTH AND SAFETY BRANCH

The Health and Safety Branch, which consisted of the Safety and Health Divisions, was responsible for safety training, answered emergency calls for aid after disasters at mines or mineral plants, and studied conditions relating to the health of workers.

SAFETY DIVISION

The Safety Division supervised first-aid and mine rescue training, investigated mine fires and explosions, studied safety conditions at mines, and carried on various other safety activities. During the past year the division personnel included 25 engineers, 26 safety instructors, 15 clerks, and 10 other employees, a total of 76. Members of the division were scattered fairly evenly through the various mining States, being headquartered at 17 different cities.

Training courses.—In the past year the Safety Division gave the full Bureau of Mines course in first-aid or in mine-rescue training to 69,662 persons in the mining and allied industries in 616 communities in 39 States. Much of this work was done at smaller mines, as may be seen from the fact that it was given in 616 communities—many more than the 489 of the previous year, when 72,038 persons completed the courses of instruction. Since the inception of the Bureau in 1910, full Bureau first-aid or mine-rescue courses have been given to the following numbers of persons in the mining industries: Coal mining, 756,776; metal mining, 114,551; petroleum industry, 77,067; metallurgical plants, 29,320; nonmetallic mining, 13,202; cement plants, 13,290; tunnel work, 4,750; and miscellaneous mining activities, 23,903; a total of 1,032,859. It is now conceded that this phase of the Safety Division's work alone enables at least 200 lives to be saved annually.

Those engaged in actual field work of the Safety Division (about 50 in all) ordinarily come in contact with more than 300,000 persons in the mining and allied industries annually, conveying to them the Bureau's safety knowledge and teachings; it is estimated that during the past year, however, the work of the field personnel reached 500,000 persons. Only 2 of the 10 all-steel mine safety cars were in active use, but 36 passenger automobiles and 14 automotive trucks were employed, and traveled 622,283 miles.

Mine fires and explosions.—In the course of the year 22 mine explosions in 10 States and 21 mine fires in 13 States were investigated, and the Bureau's personnel aided in rescue or recovery work at practically all of them where life was involved. There were 6 major fire or explosion disasters (a major disaster being one in which 5 or more lives are lost); in these, 56 were killed, a tremendous improvement compared to the average of 17 major disasters and 562 fatalities annually in the 4 years preceding the establishment of the Bureau. However, the past year's record as to disasters was by no means as

good as that in the previous fiscal year, when only 2 major disasters occurred and the total loss of life was only 17. Without doubt, much of the relative immunity from mine fires and explosions in the United States is due to various phases of safety work promoted by the Bureau, especially its advocacy of rock dusting. This practice prevents the occurrence of many widespread explosions every year; it is estimated that for the past 8 or 10 years rock dusting alone has prevented several hundred fatalities annually.

Sixty-two miscellaneous accidents in 21 States (including those from roof falls, explosives, electricity, and other causes) were investigated; the Bureau was called upon to investigate numerous surface explosions of black powder, dynamite, pulverized fuel, and gas. A Safety Division engineer was one of the experts dispatched to investigate the New London (Tex.) school disaster.

Mine reports.—One hundred and eighty-two reports on safety conditions at individual mines or plants in the mineral industries in 30 States were made during the year; some of these were transmitted confidentially to the operating company, with constructive criticism of existing conditions and definite recommendations for improvement. These reports, with verbal suggestions by Bureau men during or after the inspections on which the reports were based, resulted in hundreds of important alterations in operating conditions (equipment, methods, and practices), with a resultant definitely favorable influence on the prevention of accidents. Large numbers of these changes have been reported by field men, and several hundred letters were received during the year from mining officials voicing appreciation of the service.

Other activities.—During the past year, 1,009 persons in 32 States were qualified to teach first-aid courses and given provisional first-aid instructors' certificates, bringing the total number to 7,552 issued since 1930. Certificates of 100-percent first-aid training were issued to 135 mines or plants (representing 22 States), wherein every person had taken the Bureau of Mines first-aid course; to June 30, 1937, these certificates had been issued to 1,654 plants.

In the course of the year, 269 expert mine rescue men took the Bureau advanced course in mine rescue and recovery operations and earned certificates, bringing the total to 3,029. The Bureau accident-prevention course for higher officials in bituminous-coal mining was given in 8 States to 1,288 officials, of whom 608 took the complete course, lasting several weeks, and received certificates. In all, 6,632 certificates have been issued in 16 States since 1930. Twelve new safety clubs (Holmes Safety Association chapters) were organized in four States, bringing the total to 462 clubs in 28 States. Numerous special studies were made of rock dusting, ventilation, electricity, haulage, air conditioning, wetting methods, detecting gases, testing roof, and reducing air dustiness.

HEALTH DIVISION

The activities of the Health Division were concerned largely with means of controlling occupational-disease hazards from dust or gas, and consisted of studies of factors governing the formation of atmospheric contaminants and development of simple devices and procedures for determining and preventing them.

Dust investigations.—A midget impinger dust-sampling apparatus has been developed that is light, compact, and hand-operated and yields essentially the same results as the standard instrument. The small size and self-contained feature of this device are very desirable, especially for use in mines. The microprojection apparatus developed for particle-size determinations had been modified to permit counting impinger samples, thus increasing the ease and speed of counting dust particles. Instructions were given to 57 persons in the technique of dust sampling and counting.

Petrographic examination was made of 236 samples collected in the mineral industries, to ascertain their composition, particularly with regard to free-silica content. The spectrograph and X-ray apparatus were used to ascertain the composition of material collected in dust investigations.

Studies were made in metal mines to obtain information on the determination, generation, and control of atmospheric dust. It was found that drilling vertical holes produced more dust than drilling horizontal holes; the amount of dust generated in drilling decreased with the depth of the hole; and wet drilling with sharp bits caused higher dust concentrations than with dull bits. The following procedures were found to be beneficial in reducing the dissemination of dust into the air: Increased flow of water through the drill; reduction of air leakage through drill steel; use of compressed air-water blasts during and after blasting; generalized sprinkling of active workings; use of water curtains; and increased ventilation. Several brief papers describing these investigations are being prepared for publication in the fiscal year 1938.

Analysis of mine gases.—In connection with studies on the cause of mine explosions, the control and extinguishing of mine fires, and the promotion of safe and hygienic working conditions, 1,243 samples of gases taken in mines and tunnels were analyzed.

ADMINISTRATIVE BRANCH

The administrative branch contained the Information and the Office Administration Divisions.

INFORMATION DIVISION

The work of the Information Division included the editing and distribution of publications, supervision of motion-picture production and circulation, maintenance of the Bureau library, and preparation of exhibits.

Editorial.—During the fiscal year 13 bulletins, 8 technical papers, 3 miners' circulars, 72 separate chapters comprising Minerals Yearbook, 1937, 1 economic paper, and 4 miscellaneous reports were edited and sent to the printer—a total of 101 printed publications. Moreover, during the year 48 chapters from Minerals Yearbook, 1936, were prepared for publication as reprints, and 9 other publications were reprinted. Owing to lack of printing funds, however, only a part of the Bureau's output could be printed at Government expense; consequently, 222 papers were submitted for publication in the technical and trade press.

The division also edited 37 reports of investigations and 63 information circulars—papers that supply promptly to the mining industry and general public results of Bureau investigations that are usually described in detail in later printed reports or that give salient facts on the mineral industries in concise form suitable for use in reply to queries. In addition, 17 periodical reports were edited.

These publications—497 in all—involved the editing of 28,709 pages of manuscript.

Publications.—During the past fiscal year 124,000 copies of the free editions of printed Bureau publications and approximately 280,000 reports of investigations, information circulars, and monographs were distributed by the division. These were sent, however, only as the result of a direct request either for a specific publication or for all publications on a particular subject. In addition, the Superintendent of Documents sold about 100,000 copies of the Bureau's printed reports.

Numerous brief statements announcing the issuance of new publications or describing current investigations were supplied to the daily and technical press. These short items were printed widely, and they effectively acquainted the public with the results of the Bureau's work.

More than 66,000 letters requesting publications or information on the Bureau's activities and general mining subjects were answered.

Motion-picture production.—As a means of disseminating information on safety and efficiency in the mineral industries, the Bureau maintains what is perhaps the largest library of educational motion-picture films in the world. These films are prepared under the supervision of the division, through the cooperation of industrial concerns that bear the entire cost of production and that of providing copies for distribution.

During the year 3 new film subjects were added, 7 revised, and 594 additional reels obtained for circulation. Through a cooperative arrangement between the National Park Service and the Bureau of Mines, the division obtained the assistance of one of the country's largest industrial organizations in the sponsorship of films depicting the Bryce Canyon and Zion National Parks.

Motion-picture circulation.—Circulation of the Bureau's motion-picture films, and other graphic services, such as drafting and photography, are centralized at the Pittsburgh Experiment Station, but there are 16 subdistributing centers for films throughout the country, selected with regard to accessibility. The films are loaned to schools, churches, clubs, civic and business organizations, miners' local unions, etc. No charge is made for use, but exhibitors are asked to pay transportation charges. On June 30, 1937, the Bureau had 1,981 sets of films, including 3,775 reels, aggregating 2,098,000 feet. During the year the films were shown on 100,342 occasions, before an estimated audience of 8,809,000. The attendance was 31 percent higher than in the last fiscal year.

Library.—The year's accessions to the library comprised 3,782 books and pamphlets, 326 periodicals were received currently, and 3,135 books were loaned for use outside the library.

Exhibits.—The division prepared, installed, and supervised nine exhibits illustrating Bureau activities at expositions and conventions.

OFFICE ADMINISTRATION DIVISION

The Office Administration Division is charged with handling personnel matters, property records, accounting, multigraphing and mimeographing, and general administrative routine.

Property.—Records as of June 30, 1937, show the following valuation of Bureau property:

Automobiles and trucks.....	\$85, 353. 51
Canvas and leather goods.....	3, 876. 74
Drafting and engineering instruments.....	11, 192. 83
Electrical equipment.....	68, 197. 00
Hardware and tools.....	35, 288. 36
Household equipment.....	20, 800. 78
Laboratory apparatus.....	515, 770. 00
Medical equipment.....	9, 551. 99
Office furniture and equipment.....	356, 512. 99
Photographic apparatus.....	31, 792. 54
Machinery and power-plant equipment.....	1, 034, 214. 44
Land, buildings, and improvements.....	2, 464, 880. 92
Rescue cars and specialized apparatus.....	406, 470. 00

5, 043, 902. 10

This property is located in Washington and at various field stations and offices of the Bureau.

Personnel.—On June 30, 1937, there were 698 full-time employees on duty in the Bureau, distributed as shown in the following table:

	Classification and number of appointees				
	Profes- sional	Subpro- fessional ¹	C. A. F.	Custo- dial ²	Total
Washington.....	³ 40	3	149	6	198
Pittsburgh.....	⁴ 93	52	56	46	247
Field.....	⁵ 142	46	47	18	253
Total.....	275	101	252	70	698

¹ Includes instrument makers, safety instructors, laboratory aids, assistants, etc.

² Includes laborers, mechanics, messengers, etc.

³ Engineers, 17; chemists, 1; miscellaneous, 22; total, 40.

⁴ Engineers, 44; chemists, 33; miscellaneous, 16; total, 93.

⁵ Engineers, 68; chemists, 29; miscellaneous, 45; total, 142.

In addition to the foregoing full-time employees, the following employees held appointments on a when-actually-employed basis: 54 Consultants; 94 excepted; 12 classified; 17 unclassified; and 39 employed on field agreements.

FINANCES

The total funds available to the Bureau of Mines for the fiscal year ended June 30, 1937, including direct appropriations, departmental allotments, reappropriated balances, and sums transferred from other departments for service work, were \$2,229,261.15. Of this amount \$2,223,022.17 was spent, leaving an unexpended balance of \$6,239.28. On the regular work of the Bureau, \$2,162,714.37 was expended. This figure is subject to slight corrections due to unpaid obligations.

Table 1 presents classified and complete information regarding the financial history of the Bureau since its establishment in 1910.

Table 2 gives a statement of the distribution of Congressional appropriations to the branches and divisions and the expenditure of these funds in 1937, by Bureau divisions.

TABLE 1.—Bureau of Mines Appropriations and Expenditures, Fiscal Years Ended June 30, 1911–37

Fiscal year	Appropriated to Bureau of Mines	Departmental allotments ¹	Funds transferred from other departments ²	Total funds available for expenditure	Unexpended balances	Total expenditures	Expenditures exclusive of service items ³
1911-----	\$502,200.00	\$34,200.00	-----	\$536,400.00	\$22,518.27	\$513,581.73	\$513,581.73
1912-----	475,500.00	45,640.00	-----	521,140.00	6,239.77	514,900.23	514,900.23
1913-----	583,100.00	47,850.00	-----	630,950.00	4,087.20	626,862.80	626,862.80
1914-----	664,000.00	57,307.79	-----	721,307.79	4,678.29	716,629.50	716,629.50
1915-----	730,500.00	55,424.60	-----	785,924.60	4,178.11	781,746.49	781,746.49
1916-----	757,300.00	48,710.87	-----	806,010.87	9,053.63	796,952.24	796,952.24
1917-----	981,050.00	52,400.00	-----	1,033,450.00	48,588.10	984,871.90	984,871.90
1918-----	1,467,070.00	51,901.98	\$3,062,000.00	4,589,971.98	395,745.10	4,185,226.88	1,172,939.64
1919-----	\$3,245,285.00	49,542.86	\$8,600,000.00	11,894,827.86	2,452,236.78	9,442,591.08	1,137,471.37
1920-----	1,216,897.00	52,800.00	-----	1,269,697.00	9,592.18	1,260,140.82	1,245,891.36
1921-----	1,362,642.00	62,618.72	666,720.00	2,091,980.72	13,985.89	2,077,994.83	1,412,923.15
1922-----	1,474,300.00	59,800.00	182,200.00	1,716,300.00	52,120.45	1,664,179.55	1,483,038.47
1923-----	1,580,960.00	70,814.30	97,100.00	1,748,814.30	10,959.08	1,737,855.22	1,640,840.57
1924-----	1,784,959.00	50,710.00	347,820.00	2,183,489.00	38,085.43	2,145,403.57	1,804,800.41
1925-----	2,028,268.00	57,500.00	236,465.86	2,322,233.86	107,743.20	2,214,490.66	1,998,669.20
1926-----	1,875,010.00	81,220.00	510,501.15	2,466,731.15	28,891.78	2,437,839.37	1,841,150.80
1927-----	1,914,400.00	94,443.39	325,000.00	2,333,843.39	44,871.29	2,288,972.10	1,926,910.12
1928-----	3,025,150.00	113,266.45	328,000.00	3,466,416.45	7,736,235.62	2,730,180.83	1,997,270.66
1929-----	2,725,118.00	103,000.00	205,500.00	3,753,094.67	8,152,701.34	3,600,393.33	2,280,960.68
1930-----	2,274,670.00	123,300.00	166,200.00	2,684,386.38	9,135,714.93	2,548,671.45	2,216,995.72
1931-----	2,745,060.00	120,680.91	166,500.00	3,134,595.10	10,195,534.37	2,939,060.73	2,304,121.45
1932-----	2,278,765.00	137,866.48	194,500.00	2,770,712.18	11,344,689.43	2,426,022.75	2,186,799.92
1933-----	1,860,325.00	75,100.00	184,000.00	2,361,138.96	12,475,895.41	1,885,243.55	1,710,949.42
1934-----	1,574,300.00	50,230.00	17,000.00	1,872,586.04	13,397,131.28	1,475,454.76	1,254,846.72
1935-----	1,293,959.07	50,000.00	126,513.10	1,520,472.17	14,34,154.47	1,486,317.70	1,349,490.11
1936-----	1,970,311.00	69,500.00	47,570.00	2,114,966.51	15,12,817.54	2,102,148.97	2,058,175.91
1937-----	2,093,200.00	69,000.00	65,606.00	2,229,261.45	16,6,239.28	2,223,022.17	2,162,714.37
1938-----	2,222,450.00	83,600.00	60,000.00	2,368,868.32	-----	-----	17 2,305,450.00

¹ Includes printing and binding, stationery, and contingent funds.

² Includes proceeds from sales of residue gas.

³ Service items include Government fuel yards, helium, and other investigations and services for other departments.

⁴ Includes gas investigations for War Department.

⁵ Includes \$1,586,388 for Government fuel yards.

⁶ Includes War Minerals Relief Commission, \$8,500,000.

⁷ Includes \$719,476.67 unexpended balance reappropriated.

⁸ Includes \$120,216.38 unexpended balance reappropriated.

⁹ Includes \$102,354.19 unexpended balance reappropriated.

¹⁰ Includes \$159,580.70 unexpended balance reappropriated.

¹¹ Includes \$241,713.96 unexpended balance reappropriated.

¹² Includes \$231,056.04 unexpended balance reappropriated.

¹³ Includes \$50,000 unexpended balance reappropriated.

¹⁴ Includes \$27,585.51 unexpended balance reappropriated.

¹⁵ Includes \$2,612.45 unexpended balance reappropriated.

¹⁶ Includes \$3,418.32 unexpended balance reappropriated.

¹⁷ Estimate.

TABLE 2.—Bureau of Mines Expenditures, Fiscal Year 1937

Branch or division	General ex- penses	Operating rescue cars and stations and investi- gation of ac- cidents	Testing fuel	Mineral mining in- vestiga- tions	Oiland gas in- vestiga- tions	Ex- penses, mining experi- ment stations	Eco- nomics of min- eral in- dustries	Helium produc- tion	Build- ings and grounds, Pitts- burgh, Pa.	Gas produc- tion	Print- ing and binding ex- penses	Con- tingent ex- penses	Special funds	Total
Office of the Director.....	\$11, 100					\$1, 268								\$12, 368
Office of Assistant to the Director.....	9, 660					1, 811	\$775							12, 246
Administrative Branch:														
Office Administration Division.....	30, 204	\$23, 540	\$2, 514		\$1, 125	2, 183	5, 784	\$3, 580	\$5, 309		\$1, 410	\$12, 966		90, 615
Information Division.....	4, 961	12, 865	8, 163	\$14, 943	13, 534	8, 803	13, 227				2, 578			79, 074
Total.....	35, 165	33, 405	10, 677	14, 943	14, 659	10, 986	19, 011	3, 580	5, 309		3, 988	12, 966		169, 689
Office of Chief Mining Engineer.....		8, 922									390			9, 312
Technologic Branch:														
Coal Division.....		127, 541	174, 059			2, 412			82, 202		8, 101			394, 375
Explosives Division.....		61, 506				1, 447								62, 953
Metallurgical Division.....				113, 413		163, 764					6, 564			283, 741
Mining Division.....		44, 171		111, 775		9, 603					65			165, 614
Nonmetals Division.....				2, 461		86, 981					1, 855			91, 297
Petroleum and Natural-gas Division.....					251, 104	1, 447		55, 614		\$8, 987	2, 202			319, 354
Principal mineral technologist.....				7, 698										7, 698
Total.....		233, 218	174, 059	235, 347	251, 104	265, 654		55, 614	82, 262	8, 987	18, 787			1, 325, 032
Economics Branch:														
Coal Economics Division.....							47, 623				894			48, 517
Mineral Production and Economics Divi- sion.....							97, 227				25, 862			123, 089
Nonmetal Economics Division.....							51, 716				839			52, 555
Foreign Minerals Division.....							24, 850				162		\$4, 447	29, 459
Metal Economics Division.....							36, 188				1, 001			36, 188
Petroleum Economics Division.....							62, 548							63, 549
Total.....							320, 152				28, 758		4, 447	353, 357
Health and Safety Branch:														
Safety Division.....		271, 504									13, 077			284, 581
Health Division.....		56, 437												56, 437
Total.....		327, 941									13, 077			341, 018
Total appropriations.....	56, 000	609, 365	185, 400	250, 860	265, 866	279, 850	339, 990	62, 612	87, 690	9, 179	65, 000	13, 000	4, 449	2, 220, 261
Total expenditures.....	55, 925	608, 486	184, 736	250, 290	265, 763	279, 719	339, 938	59, 194	87, 571	8, 987	65, 000	12, 966	4, 447	2, 223, 022
Balances.....	75	879	664	570	103	131	52	13, 418	119	192		34	2	6, 239

1 Available for expenditure in 1938.

The following table covers expenditures by the Bureau of Mines to June 30, 1937, from allotments from National Industrial Recovery and Public Works appropriations:

Project no.	Description	Allotment	Balance	Expenditure
1	Repair mine rescue station, McAlester, Okla.....	\$1,000	-----	\$1,000.00
2	Plans for building for experiment station, College Park, Md.....	16,800	-----	16,800.00
3	Buildings and grounds, Pittsburgh and Bruceton, Pa.....	172,000	\$4.48	171,995.52
4	Roads, Pittsburgh and Bruceton.....	13,000	1.16	12,998.84
5	Repairs to experimental mine.....	15,000	.17	14,999.83
6	Repairs to building and equipment, Bartlesville Experiment Station.....	45,000	.52	44,999.48
7	Paving around Bartlesville Experiment Station.....	10,000	3.75	9,996.25
8	Building and equipment, experiment station, Tuscaloosa.....	200,000	6.50	199,993.50
9	Locating underground water resources in Nevada.....	4,950	41.59	4,908.41
10	Extension of Petroleum Experiment Station, Bartlesville.....	269,500	5.31	269,494.69
11	Fence, electric circuits put underground, roads, etc., at experimental mine, Bruceton.....	43,450	2.99	43,447.01
12	Building for mining experiment station, College Park, Md.....	350,000	-----	(1)
13	5-car garage, Vincennes.....	7,500	-----	(2)
14	Construction of bombproofs, protective partitions, and testing floors, for study of hydrogenation of coal, etc.....	17,000	-----	17,000.00
15	Enlarging hydrogenation laboratory.....	30,000	1.92	29,998.08
	Total.....	1,195,200	68.39	837,631.61

¹ Transferred to Procurement Division, Treasury Department, for supervision of construction.

² Transferred to Post Office Department for construction in connection with new post-office building.

GEOLOGICAL SURVEY

W. C. Mendenhall, *Director*

DURING the fiscal year 1937 the Geological Survey continued its systematic work in investigating, mapping, and reporting on the geology, the mineral and water resources, and the physical features of the United States. The results of this work are basic in all conservational activities, as those who plan and direct the conservation policies toward the wise development and use of the Nation's resources must first have the facts about the quantity, quality, distribution, and availability of those resources and adequate maps with which to pursue and record further studies. Through its technical supervision of prospecting, mining, and producing operations on public and Indian lands under permits, leases, and licenses, the Survey was directly engaged in the practical application of conservation policies.

During the year the aggregate expenditures for which the Geological Survey was responsible amounted to about \$4,222,000, as compared with about \$4,620,000 during the preceding year. These aggregates were made up of the regularly appropriated funds, the cooperative funds from States, counties, and municipalities, the funds transferred from other departments of the Government for types of work falling within the Survey's field, and the emergency funds derived chiefly from the Public Works Administration and devoted largely to mapping of various types, to river-utilization surveys of power and storage resources, to conservation work on public lands, and in a lesser degree to the study of mineral resources.

Although there was a decline from the preceding year in aggregate funds available, the fiscal situation has nevertheless improved, because the Congress, in view of the decreasing availability of emergency funds, had increased the regular appropriation to \$2,807,000, from the \$2,285,000 of the preceding year.

As a part of our informal service to the public, more than 4,500 tests of mineral and rock samples were made and more than 2,200 chemical analyses were completed.

More than 14,500 square miles of new area was surveyed in the field topographically. This work will yield 102 contoured topographic maps of areas in 36 States and in Puerto Rico. In addition, by the aid of aerial photography, 4,780 square miles was surveyed in 5 States for the production of planimetric maps without contours.

Fifty-seven book publications of the Survey's regular series, aggregating nearly 6,000 pages of printed matter, dealing with geology, mineral resources, and water supplies were issued during the year, and about 673,000 copies of 296 topographic and other maps were printed. The geologic map of Texas was completed.

There were 59 geologic parties in the field in 33 States. The field investigations on several continuing projects were completed, and work was begun on new projects including geologic studies of areas in Idaho, Arizona, and in the Big Horn Basin in Wyoming and the geologic aspects of the Ohio River flood.

Measurements of stream flow were maintained at 3,379 stream-gaging stations. All the States, the District of Columbia, and Hawaii are affected by this work. Drought and flood studies were continued during the year.

The work on underground waters, so important in the drought-stricken areas, was continued, much of it in cooperation with the States, and 75 reports on this topic were released for public use.

In the land-classification and mineral-leasing activities of the Survey more than 9,000 formal findings of technical fact were made regarding the mineral resources, water power, or storage possibilities of public land, and the Government's ownership of great reserves of coal, oil and gas, potash, phosphate, and other minerals was safeguarded. Technical supervision was given to more than 9,000 properties containing oil and gas and more than 600 containing coal, and 100 containing other minerals. On Indian lands more than 5,300 oil and gas leases were supervised, as well as more than 100 properties containing coal, asphalt, and lead and zinc.

GENERAL SUMMARY OF THE YEAR'S ACTIVITIES

Geologic work.—Fifty-nine field parties were active during the year, and work was done in 33 States. Work was continued throughout the year in metal-mining districts of Colorado, Idaho, and New Mexico and in the oil fields of Kansas and Michigan. Cooperative work was also done in Arizona, Florida, Mississippi, and Virginia. The geologic map of Texas was completed. Physiographic and geologic studies were continued in the Yosemite and Sequoia National Parks, Calif., Zion National Park, Utah, and Glacier National Park, Mont., in cooperation with the National Park Service. Geologic examinations of areas in the Carolinas, Georgia, and Alabama were made for the Forest Service, and of dam and reservoir sites for the Office of Indian Affairs and the War Department. Work on many projects was completed in 1937, and work was begun on new projects including studies of the areal and economic geology of the Irwin quadrangle, Idaho, the Pearce quadrangle, Ariz., and the Big Horn Basin, Wyo.,

and of the geologic aspects of the Ohio River flood. The determination and compilation of the physical properties of rocks, as part of the "borderland" field between geology and chemistry and physics, received increasing attention. More than 4,500 tests of mineral and rock samples were made, including 1,587 chemical analyses in connection with the Geological Survey's projects and 1,570 tests for persons not officially connected with the Survey. Many tests were made of activable bleaching clays, two deposits of which are now in commercial production, largely as a result of study and tests made in the Survey's laboratory. Temperature measurements of wells were made in two States. The section of geophysical prospecting continued work on projects in hand and made new field studies related to ores and ground water in Nevada and oil and gas in Michigan. It also continued laboratory studies of the construction and operation of geophysical apparatus.

Explorations in Alaska.—In the field season of 1936 seven field projects were carried on in Alaska. Of these projects, four were principally concerned with geologic investigations relating to the mineral resources of the Territory, two were primarily topographic, and one was a general survey of recent mining developments in the more important camps. In addition, an assay laboratory was maintained at College, Alaska. The general collection of statistics regarding the production of mineral commodities was continued. For the field season of 1937, three field projects had been started before the end of the fiscal year, and two additional field projects were to be undertaken as soon as practicable. All these field projects will be continued throughout the open season as late as conditions permit.

Topographic mapping.—The area covered by new topographic surveys, resurveys, and revision amounted to 14,502 square miles, representing 102 topographic maps with contours. The topographic mapping was done in 36 States and in Puerto Rico. The area covered by planimetric maps without contours, resulting from aerial photography, covered 4,780 square miles in five States. In addition, aerial photographs were used as bases for topographic mapping in 26 quadrangles. Stereoscopic plotting apparatus, utilizing single-lens aerial photographs, as a practical demonstration of the use of such equipment in connection with topographic mapping, is being extensively applied in the mapping of the Tennessee River Basin in cooperation with the Tennessee Valley Authority and in special areas in Virginia, in cooperation with the Conservation and Development Commission of Virginia, Geological Survey. The transportation map of the United States, in sections, which is being made for the Bureau of Public Roads was continued with increased output. The maps of Delaware, in two sections; Washington, in nine sections; Rhode Island, in one section; Connecticut, in one section; and South Carolina, in five sections, were published. The maps of Massachusetts, in three sections; New York, in seven sections; and Maryland, in three sections, are in course of publication.

Investigations of water resources.—The water-resources branch collected and made available for publication stream-flow records at 3,379 river-measurement stations on rivers in the 48 States, the District of Columbia, and the Territory of Hawaii, thus obtaining authentic information on the behavior of streams in drought in flood, and under normal conditions—information that is invaluable for planning of projects for use or control of the surface water supply. It investigated underground water supplies in 22 States and in Guam and Hawaii and obtained basic information on the occurrence, quantity, and quality of underground water supplies, which is essential for the development, conservation, and use of ground water upon which a large part of the population of the country must depend. Drought studies have been continued. Investigations of stream-flow and silt movement of streams in eight projects of the Soil Conservation Service and similar

studies on the Colorado River have also been continued. The annual report on the capacity of water wheels in water-power plants of 100 horsepower or more in the United States on January 1, 1937, was released in April 1937. Engineers of the branch had general supervision of operation under permits and licenses of the Federal Power Commission in connection with 150 projects. Investigations of the water problems along the international boundary between the United States and Canada were continued for the State Department. The collection of information on recent outstanding floods was continued. Partial or complete analyses were made of 1,754 samples of water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural use and for domestic use (not related to questions of health).

Classifying and leasing public land.—The Conservation Branch made 9,036 formal findings of technical fact involving the mineral resources, water power, or storage possibilities of public lands; added 100,699 acres to outstanding water-power reserves and eliminated 17,507 acres therefrom; defined the "known geologic structure" of 2 producing oil and gas fields amounting to 9,354 acres; completed 1,261 miles of river-utilization surveys and 155 square miles of reservoir surveys in public-land States, and made geologic and geophysical studies of formation materials and conditions at 61 dam sites; supervised activities and operations under 166 power projects licensed by the Federal Power Commission and 172 permits and grants from the Interior Department; supervised on public lands 9,052 oil and gas holdings involving 4,112 productive wells and 657 coal properties, 39 potash properties, 44 sodium properties, 18 sulphur properties, 11 phosphate properties and 1 oil-shale property; supervised on naval petroleum reserves 22 leaseholds involving 538 productive oil and gas wells; and on Indian lands 5,342 leaseholds involving 4,397 oil and gas wells, 40 lead and zinc properties, 108 coal properties and 1 asphalt property; assisted hundreds of oil and gas permittees and operators in preparation of unit plans of development and operation; formulated the revised Oil and Gas Operating Regulations, effective November 1, 1936.

Publications.—The publications of the year consisted of 57 reports in the regular series, making a total of 5,760 pages; 96 new or revised topographic and other maps; 199 reprinted topographic and other maps; and several pamphlets for administrative use. Among the book publications were reports on the mineral resources of the region around Boulder Dam, the Bayard area, New Mexico, and the Butler and Zelenople quadrangles, Pennsylvania; fuel resources of Pike County, Ky., the San Juan Basin, N. Mex., and areas in Alaska, Arkansas, Montana, and Oklahoma; spirit leveling in Connecticut and Massachusetts; records of water levels and artesian pressure in observation wells in the United States in 1935; records of wells on the Snake River Plain, Idaho; ground-water resources of the Florida Peninsula, the Elizabeth City area, North Carolina, and of the San Antonio, area and Duval, Kleberg, Medina, and Uvalde Counties, Tex.; and several stratigraphic and paleontologic papers, notably a comprehensive report on the Tertiary floras of Alaska by the outstanding authority on the subject. Besides these printed reports 30 brief papers were issued in mimeographed form as memoranda for the press.

The engraving and printing division printed more than 673,000 copies of maps and did repay work amounting to about \$220,000 for 68 other units of the Federal and State Governments.

NOTE.—Detailed tabular statements are given at the end of the report.

GEOLOGIC BRANCH

SUMMARY

Fifty-nine parties were active in the field during the year and work was done in 33 States. Work was continued throughout the year on metal-mining districts in Colorado, Idaho, and New Mexico, and in the oil fields of Kansas and Michigan. Cooperative projects were also conducted in Arizona, Florida, Mississippi, and Virginia. The geologic map of Texas, embodying the results of many years of work by the Federal and State surveys and by oil companies and private geologists, was completed and was available for distribution early in July 1937. The section of geologic map editing also aided the State surveys in the preparation and proofreading of geologic maps of California, Washington, and Iowa. Physiographic and geologic studies were continued in the Yosemite and Sequoia National Parks, Calif., Zion National Park, Utah, and Glacier National Park, Mont., in cooperation with the National Park Service, and geologic examinations of selected areas in the Carolinas, Georgia, and Alabama were made for the Forest Service. Dam and reservoir sites were examined for the Office of Indian Affairs and the War Department, and information was furnished on request to several other Federal organizations.

New projects begun in 1937 included studies of the areal and economic geology of the Irwin quadrangle, Idaho, the Pearce quadrangle, Arizona, and the Big Horn Basin, Wyo., and of the geologic aspects of the Ohio River flood.

More attention given to the determination and compilation of the physical properties of rocks, as part of the "borderland" field between geology, chemistry, and physics, and correlations between the physical properties of minerals and their chemical composition, many of which were completed during the year, will make the future identification of these minerals more rapid and more exact. More than 4,500 tests of mineral and rock samples were made, including 1,587 chemical analyses in connection with the Geological Survey's projects and 1,570 tests for persons not officially connected with the Survey. Many tests were made of activable bleaching clays, two deposits of which are now in commercial production, largely as a result of study and tests made in the Survey's laboratory. Temperature measurements of wells were made in two States.

The section of geophysical prospecting, transferred from the Bureau of Mines to the Geological Survey on July 1, 1936, continued work on projects in hand and made new field studies related to ores and ground water in Nevada and oil and gas in Michigan. It also continued laboratory studies that may lead to reduced cost in the construction and operation of geophysical apparatus.

WORK OF THE YEAR BY STATES

Alabama.—Geologic mapping was continued in the Russellville iron-ore district in Franklin, Colbert, and Lauderdale Counties, and geologic examinations were made of some other deposits of brown iron ore in the eastern part of the State and of some manganese deposits in Blount and Etowah Counties. Reports on the brown iron ore in the Russellville district and on iron ore in the Red Mountain formation in northeastern Alabama were in progress. A paper on Foraminifera of Choctaw Bluff was completed for Survey publication. Work on gold in Alabama is mentioned under "Southern Appalachians." Examinations were made for the Forest Service of proposed additions to the Black Warrior National Forest and Akmulgee division and the Talladega unit of the Talladega National Forest, and a report was prepared for the Forest Service on proposed additions to the Chattahoochee National Forest in Georgia and Alabama.

Arizona.—A field study of the geology and ore deposits of portions of the Benson and Pearce quadrangles, including the Gleeson, Courtland, Black Diamond, and Pearce mining districts, was begun. The report on the geology and ore deposits of the Ajo quadrangle was completed for Survey publication, and a paper on the physiography of the Ajo region was submitted for publication by the Geological Society of America. Progress was made on a report on the geology and mineral resources of the Tucson quadrangle and on a report on detailed mapping of the ore deposits of the Tombstone district, in cooperation with the Arizona Bureau of Mines.

Arkansas.—The report on the geology and ore deposits of the southwestern Arkansas quicksilver district was transmitted for Survey publication. The report of the western portion of the Arkansas coal field was issued as Bulletin 847-E. Reports on the fauna and stratigraphy of the Morrow group of Arkansas and Oklahoma and on recent developments in the carbonate ores of the Batesville manganese district are in preparation for official publication. Papers on the mineral taeniolite from Magnet Cove and on Pennsylvanian sedimentation in the Arkansas coal basin are in preparation for publication in some scientific magazine, and one on the lead and zinc ore-bearing formations of northern Arkansas was submitted for inclusion in the volume on the ore deposits of the Mississippi Valley to be published by the National Research Council.

California.—A comprehensive report on the general geology, oil resources, physiography, paleontology, stratigraphy, and economic phases of the Kettleman Hills and a report on the geology and ore deposits of the Grass Valley region were nearing completion for Survey publication. Field studies were made of the diatom-bearing deposits of the Temblor formation in Kern County, and a paper on comparison of diatom floras of the Temblor formation of California and the Calvert formation of Maryland and Virginia was in preparation. Investigations of the geology of the San Andreas rift; of the Death Valley region; and of the structure, stratigraphy, and oil resources of the lower Tertiary strata in Reef Ridge, in the Kettleman Plains and Dudley no. 2 quadrangle in the Coalinga region, were continued. Oil centers in California were visited to obtain data in connection with a study of source of beds of petroleum carried on in cooperation with the American Petroleum Institute. Studies of the geomorphology of the Sequoia National Park and adjoining areas in Inyo National Forest and of the northern portion of Yosemite Valley were made in cooperation with the National Park Service, and a report giving an outline of the geology of the Sequoia National Park was in preparation. Reports on Pliocene diatoms from the Kettleman Hills and on lower Pliocene mollusks and echinoids from the Los Angeles Basin and their inferred environment have been completed. Reports are in preparation on the siliceous rocks of the Monterey formation, the geology of the Palos Verdes

Hills, and the geomorphology of the San Joaquin Basin. A paper on the geologic history of Mount Whitney was submitted for outside publication. Papers in preparation for outside publication cover vein filling at Nevada City; calcium carbonate content of California Cretaceous and Tertiary sediments; significance of wet, lean, and dry gas to absence or presence of petroleum; and Nevada City-North San Juan granodiorite.

Colorado.—In continuation of the cooperative program carried on with the State of Colorado and the Colorado metal mining fund in investigations of the mining regions of the State, studies were continued of the Ouray, Red Mountain, and Sneffels-Camp Bird districts in the San Juan region and of districts in the La Plata Mountain region; in the mineral belt of the Front Range, including mapping in the vicinity of Boulder, Nederland, Central City, Ward, Idaho Springs, Jamestown, Gold Hill, and in the Cripple Creek district; in the Mosquito Range, the Sugar Loaf-St. Kevin district, and the Butte mine and other mines in the vicinity of the London fault. Studies of the geology and ore deposits of the Chattanooga district and of the Kokomo-Robinson area were begun. The report on the Snowmass region is now in press as Bulletin 884. A report on the ore deposits in the vicinity of the London fault was transmitted for Survey publication. A geologic map of the Leadville district and a geologic map of the Front Range mineral belt, both with brief explanatory text, have been prepared and will be published in advance of the comprehensive reports on these districts. A paper on the Laramide igneous sequence and differentiation in the Front Range will be published by the Geological Society of America, and one on the geology of the Neglected mine, La Plata district, by the American Institute of Mining and Metallurgical Engineers. A preliminary report entitled "Resurvey of the La Plata District" was published in volume 13, no. 9, of the Proceedings of the Colorado Scientific Society, and one on the mode of igneous intrusion in the La Plata Mountains was prepared for the section of volcanology of the American Geophysical Union. A paper on the petrologic results of a study of the minerals from the Tertiary volcanic rocks of the San Juan region was also completed for outside publication. A report on the geology of the Pine River dam site was prepared for the Reclamation Service. Geologic mapping was done in a portion of the Yampa coal field, in the Elkhead Creek, Pilot Knob, Daton Peak, and Mount Harris quadrangles.

Delaware.—See Maryland (Chesapeake & Delaware Canal).

District of Columbia.—A geologic map of the District of Columbia, with descriptive text, is in preparation for Survey publication.

Florida.—An investigation of the physical geography of Florida was made in cooperation with the Florida Geological Survey. A report on the fauna of the Alum Bluff group of Florida was completed for publication and the report on phosphate investigations in Florida, is nearing completion for official publication. A paper on mollusks of the Tampa and Suwannee limestones of Florida was transmitted to the Florida Geological Survey, and a description of seven new species and one new subspecies of mollusks from the Choctawhatchee formation of Florida was prepared for publication in some outside journal. A paper on Government prospecting for phosphate in Florida will be published by the American Institute of Mining and Metallurgical Engineers.

Georgia.—A detailed geologic study of the geology and mineral resources of the Pine Log quadrangle, including manganese ores, ocher, limonite, and barite, was begun. A report on the Coastal Plain of Georgia is being prepared in cooperation with the Georgia Division of Mines, Mining, and Geology, Department of Natural Resources. A paper on some gold deposits of Georgia was prepared for the committee on processes of ore deposition, National Research Council.

Idaho.—In cooperation with the Idaho Bureau of Mines, investigations of the geology and ore deposits were made in the Atlanta-Rocky Bar mining district, the Florence mining district, the Coeur d'Alene dry belt, and Kootenai County, and a study of the placer deposits of central Idaho was continued. The paleontology and stratigraphy of the Carboniferous formations of south-central Idaho were studied. The report on the Edwardsburg-Thunder Mountain district was sent to the Idaho Bureau of Mines and Geology for publication. Reports on the Atlanta, Warren, Florence, and Murray mining districts and on the Boise Basin were nearing completion at the end of the year, and one on the geology and mineral resources of an area around Freedom was begun. Papers on the significance of amygdules in Columbia River lava, "Modern Forty-Niners", the influence of structure on deposition in the Boise Basin, the Clark Fork-Sandpoint porphyry belt, and the genetic features of the Idaho batholith were prepared for publication outside of the Survey, and one on bedding veins near Murray was prepared for the volume on ore deposition to be published by the National Research Council. Studies of the glacial geology and physiography of portions of eastern Idaho and of the geology and ore deposits of the Borah Peak quadrangle were continued. Mapping in the Irwin quadrangle was begun, and progress was made on reports on the geology and ore deposits of south-central Idaho, on Idaho mining districts, and on the geology and mineral resources of the Paradise and Ammon quadrangles, in southeastern Idaho.

Illinois.—A geologic investigation was made in the southern part of Illinois and Indiana included in the flood area in the Ohio Valley. A report on geologic factors in the interpretation of fluorspar reserves in the Illinois-Kentucky field, was published by the Geological Survey as Bulletin 886-B. One of the Cave in Rock fluorspar district, prepared in cooperation with the Illinois Geological Survey Division, was transmitted to that organization for publication. A paper on the origin of bedding replacement deposits of the Illinois fluorspar field was published in *Economic Geology*.

Work on the late David White's report on the Pottsville flora of the Eastern Interior Basin, mainly in Illinois, was continued. Preparation of a paper on the Fusulinidae of the Pennsylvanian formations of Illinois, for publication by the State, was continued.

Indiana.—A report to be known as part 3 of the flora of the New Albany shale of Indiana and Kentucky and one on new crinoid genera from the Mississippian of Indiana were in preparation. The Ohio Valley investigation and the report on the Pottsville flora of the Eastern Interior Basin are mentioned under Illinois.

Kansas.—In cooperation with the Geological Survey of Kansas, an investigation of the rocks generally designated the "Mississippi lime" that are found in deep wells in the oil and gas fields in southeastern Kansas was continued. A report on the geology and coal resources of the southeastern Kansas coal field in Crawford, Cherokee, and Labette Counties and one on Pennsylvanian invertebrate faunas were transmitted to the Kansas Geological Survey. Some oil centers in Kansas, Oklahoma, and Texas were visited to collect data in connection with a comprehensive report on source beds of petroleum. Studies of the lead and zinc deposits of southeastern Kansas included in the Tri-State district are mentioned under Oklahoma.

Kentucky.—See Indiana (New Albany shale) and Illinois (Ohio Valley investigation and report on the Pottsville flora).

Maine.—A paper on Graftonite from Greenwood, Maine, was published in the *American Mineralogist*.

Maryland.—A report on the Upper Cretaceous deposits of the Chesapeake & Delaware Canal of Maryland and Delaware was completed for publication by the Maryland Geological Survey. Examinations of the geology of the Savage

River dam sites were made for the district engineer of the War Department. In informal cooperation with the Maryland Geological Survey, geologic examinations were made in portions of Frederick County, and the geology of the Westminster quadrangle was reviewed. A paper on *Crassatellites* from the St. Marys formation was submitted for outside publication.

Massachusetts.—In connection with a general study of the granites of New England, investigations were made of areas around Chelmsford, Westford, and Graniteville.

Michigan.—A resistivity survey in some of the oil districts near Lansing was made by members of the geophysical section in cooperation with the State geologist, division of geology, Department of Conservation of the State of Michigan. Studies of Devonian fossils and stratigraphy of Michigan were continued.

Mississippi.—Studies of the Upper Cretaceous deposits of northern Mississippi in connection with a revision of the geologic map and a report on the stratigraphy of the State were in progress. A report on the geology of the Jackson area was in preparation for Survey publication. Examinations were made in connection with the drilling of a deep test well (State of Mississippi fee no. 2 well) for oil and gas by the State on State-owned land near Jackson, and a report on cores and cuttings from the well was prepared for the Mississippi Mineral Lease Commission, Jackson. A report on the well was also prepared for the Mississippi Geological Survey. A report on the gas reserves and probable life of the Jackson gas field was made to the Public Works Administration. A paper on the Prairie Bluff chalk and Owl Creek formation was prepared for publication by the American Association of Petroleum Geologists.

Missouri.—Progress was made on an official report on the stratigraphy and fauna of the Louisiana limestone and on a paper for outside publication on the Warsaw fauna (Mississippian) of the Joplin district.

Montana.—Geologic mapping of the geology and mineral resources of the Little Rocky Mountains and adjoining regions in Phillips and Blaine Counties was continued, and an investigation made of the geology of the Fort Belknap Indian Reservation. General reconnaissance studies of the physiography and glacial geology of portions of western Montana, northwestern Wyoming, and eastern Idaho were continued, and in cooperation with the National Park Service an investigation of the geologic features of Glacier National Park was made and a report prepared for the Park Service. The study of the Fort Union and associated formations of North Dakota, Montana, and Wyoming was continued. A study of scarps and other evidences of Pleistocene and Recent faults in southwestern Montana was in progress. The report on the geology and ore deposits of the Libby quadrangle was nearly completed, and one on the structure and stratigraphy of the Black Hills rim, Montana and Wyoming, was in progress. The report on the geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties was issued as Bulletin 847-F. Work on a paper on suggested correlations of the Lance and Fort Union formations in Montana, North Dakota, and South Dakota was continued. Papers on the following subjects were submitted for outside publication: Quartz monzonite and related rocks of the Libby quadrangle; a new locality for Middle Cambrian fossils near Noxon; helvite from the Butte district; amphibolization of sills and dikes in the Libby quadrangle; asymmetric distribution of stream terraces in southeastern Montana; and fossil plants from the Colgate sandstone and adjacent strata.

Nevada.—Geologic field mapping was completed and reports were in progress on the Comstock lode at Virginia City and on the general geology and ore deposits of the Hawthorne and Tonapah quadrangles. Geophysical studies were made at Mineral Hill, Spring Valley, Caliente, Delamar, Hawthorne, and Comstock.

Preparation of a report on the Basin Ranges was continued. An abstract of a paper on the Slumbering Hills was published in *Economic Geology*, and a paper on the geology of the Searchlight district, Clark County, was transmitted to the Nevada State Bureau of Mines for publication. Other papers were prepared on early Jurassic orogeny in west-central Nevada; Triassic and Jurassic rocks of the Hawthorne and Tonopah quadrangles; and recent fault scarps in the western part of the Great Basin, Nevada and California, for the Geological Society of America; and on the Pennsylvanian-Permian boundary in southern Nevada, for the American Association of Petroleum Geologists.

New Hampshire.—In connection with a study of the granites of the New England States, investigations were conducted at Concord.

New Jersey.—Papers on bentonite in the Upper Cretaceous of New Jersey and on the stratigraphic significance of *Kummelia*, a new Eocene bivalve genus from New Jersey, were submitted for publication in outside periodicals.

New Mexico.—Study of the geology and ore deposits of the Little Hachet Mountains, in cooperation with the New Mexico Bureau of Mines, was continued. An area in Rio Arriba County not previously mapped, on the east side of the San Juan structural basin, including land-grant and Indian lands, was studied with particular reference to coal and oil resources, including the coal-bearing Cretaceous rocks of the Lumberton-Monero area. Official reports covering these recent investigations, together with earlier investigations in this basin and on the geology and potash resources of the Potash Mines area, were in progress. A report on the geology of the Zuni Dam was made for the Office of Indian Affairs. A paper on the geologic significance of a geothermal gradient curve for the Dooley No. 7 well will be published by the American Association of Petroleum Geologists.

New York.—Reports on the structure and gas possibilities of the Oriskany sandstone in Steuben, Yates, and parts of adjacent counties, and on Pleistocene diatoms from Long Island were completed for Survey publication. Progress was made on a report on talc in the Gouverneur district, field work for which was done under Public Works allotment in 1934. Other papers were in preparation on the geology of the Clove and Millbrook quadrangles for Survey publication, on the structural petrology of these quadrangles for outside publication, and a paper on fossil plants inclosed in pyrite nodules from the Tully (Devonian) limestone, also for outside publication.

North Carolina.—A report for Survey publication on Mollusca from the Miocene and lower Pliocene of Virginia and North Carolina, with notes on the stratigraphy, was advanced; and one on Foraminifera, diatoms, and mollusks from test wells near Elizabeth City was completed. Papers were submitted for outside publication on a new subspecies of *Pecten* from the upper Miocene of North Carolina; sphalerite from a pegmatite near Spruce Pine; and the molluscan fauna of the Pliocene Croatan sand of North Carolina. Others were in preparation on Pleistocene fossils from a well at Hatteras and Miocene diatoms from Hamilton Wharf.

North Dakota.—For work on the Fort Union and associated formations, see Montana. Progress was made in the compilation of material for a geologic and topographic map of the State. The report on the geology and coal resources of the Minot area was in preparation.

Ohio.—Several places along the Ohio River were visited in connection with a geologic investigation of the flood area in the Ohio Valley. A paper on Devonian-Carboniferous stratigraphy and faunas from Ohio and Pennsylvania was in preparation. Deep-well drilling is reported under Pennsylvania.

Oklahoma.—An investigation was begun of the geologic structure, stratigraphy, and petroleum possibilities of an area adjoining Black Knob Ridge in and near the west end of the Ouachita Mountains. Field and office work on an investigation of the subsurface geology and oil and gas resources of Osage County was

continued, and a report covering Tps. 22 and 23 N., Rs. 10 and 11 E., was completed for Survey publication. The report on the geology and mineral resources of the Howe-Wilburton district was completed for publication as Bulletin 874-D. A report on the geology and fuel resources of the McAlester district was issued as Bulletin 874-A, and one on the Quinton-Scipio district is in press as Bulletin 874-C. Reports were in progress on the stratigraphy and fauna of the Morrow formation, the stratigraphy and Mississippian faunas of the Wyandotte quadrangle, the fauna of the Moorefield formation, and the flora of the coal beds of eastern Oklahoma. Work in the Missouri, Kansas, and Oklahoma lead and zinc areas, including detailed areal mapping, studies of mines and stratigraphy, and structure contour mapping, was continued. Papers on the Black Knob Ridge and on the Verden sandstone, an exposed shoestring sand of Permian age, were prepared for the American Association of Petroleum Geologists. An abstract of a paper on the stratigraphy of the pre-Carboniferous rocks of Black Knob Ridge was published in the Digest of the Tulsa Geological Society. Papers on the origin and distribution of the Bartlesville and Burbank shoestring oil sands in parts of Oklahoma and Kansas and on new shoestring oil fields expected in Osage County, Okla., and Cowley and Butler Counties, Kans., were submitted to the American Association of Petroleum Geologists for publication, and one on physical characteristics of the Bartlesville and Burbank sands in northeastern Oklahoma and southeastern Kansas was published in the bulletin of the American Association of Petroleum Geologists. Work on source beds of petroleum is mentioned under Kansas.

Pennsylvania.—Reports are in preparation on the geology and mineral resources of the Honeybrook and Phoenixville quadrangles and, in cooperation with the Pennsylvania Geological Survey, on the York and Hanover quadrangles. Studies of the regional metamorphism in the lower Kittanning coal beds of western Pennsylvania were continued. Studies were also made of the stratigraphy and flora of the Pocono formation of West Virginia and Pennsylvania; the structure of the northern anthracite coal basin; and deep-well drilling in the Appalachian region. A paper on the structure of the Honeybrook uplift will be published by the Geological Society of America.

South Carolina.—A paper on massive low-fluorine topaz at the Brewer mine was submitted to the American Mineralogist, and one on an extraordinary topaz replacement body in the Brewer mine was submitted to the American Geophysical Union for publication. A paper on Pliocene and Pleistocene mollusks from the Intracoastal Waterway in South Carolina was prepared for publication, and one on the Pleistocene Horry clay and Pamlico formation near Myrtle Beach was submitted to the Washington Academy of Sciences. (See also Southern Appalachians.)

Southern Appalachians.—The report on gold deposits of the southern Appalachians, including areas in Virginia, North Carolina, South Carolina, Georgia, and Alabama, was completed for Survey publication.

Tennessee.—A report on limestone for concrete aggregate for a dam near Chattanooga was prepared for the Tennessee Valley Authority.

Texas.—Studies of the structure, stratigraphy, and fossils of the Navarro group; the faunas of the Rio Grande embayment of Texas and adjacent regions in Mexico; the geology of the Sierra Diablo region, west Texas; and the stratigraphy, geomorphology, and structure of the southern Guadalupe Mountains were continued. A geologic map of Texas was issued. The report on the brown iron ores of east Texas was transmitted for Survey publication, and reports on the geology and ore deposits of the region around Terlingua and of the Shafter silver district were completed. Reports on new fusulinids from the Cisco group (Pennsylvanian) of the Brazos River region, on Guadalupe faunas, a revision of

Professional Paper 58, and on water possibilities in the El Paso district as determined by geophysical methods were in preparation. A correlation chart of the Cretaceous formations of the Atlantic and Gulf Coastal Plain and west Texas was completed for the National Research Council. Papers were prepared for outside publication on structural features of the quicksilver lodes of the Terlingua region, for the committee on processes of ore deposition of the National Research Council; braunite from Mason County, for the American Mineralogist; a sphenolith in the Terlingua district, for the American Geophysical Union; a microscopic study of goethite and hematite in the brown iron ores of east Texas, for the American Mineralogist; and an abstract on Permian rocks of the southern Guadalupe Mountains, for the Digest of the Tulsa Geological Society. Work on source beds of petroleum is reported under Kansas.

Utah.—Geologic mapping of the greater part of the Strawberry Valley quadrangle for the purpose of classifying land as to oil shale, coal, oil, gas, and phosphate, and a study of the stratigraphy was begun. Investigations of the coal resources and oil and gas possibilities of the Hanksville-Caineville district and detailed studies of the structure, igneous rocks, mineral resources, and physiography of the Henry Mountains were continued. Geologic studies of the Marysville district were continued, and a preliminary report on the alunite deposits of the region was submitted for Survey publication. A general geologic reconnaissance of the plateau country of southern Utah, including Zion Canyon, was in progress. A report on the geology of the area between the Green and Colorado Rivers in Grand and San Juan Counties was completed for Survey publication. The report on the geology and mineral resources of the Randolph quadrangle, Utah and Wyoming, is nearing completion. Reports on the geology of the Green River Desert-Cataract Canyon region; the structure of southeastern Utah; the Cretaceous-Eocene boundary in central Utah; and iron ores of Bull Valley were in preparation.

Vermont.—Progress was made on the study of the metamorphic rocks in east-central Vermont, in cooperation with the Geological Society of America. Granites of Vermont were studied in connection with the general investigation of granites of the New England States.

Virginia.—The report on the titanium deposits in Nelson and Amherst Counties was nearly completed. Geologic work was done in the Galax and Independence quadrangles and adjoining portions of the Max Meadows and Speedwell quadrangles in connection with the cooperative report on the geology of the Gossan Lead, to be published by the Virginia Geological Survey. For work on gold deposits, see Southern Appalachians.

Washington.—Investigation of the areal geology, mineral resources, and mines of the Metaline quadrangle, Pend Oreille County, was continued. A paper on inesite from Quinault was submitted for outside publication.

West Virginia.—Studies of the flora of the Pocono formation of West Virginia and of the Pottsville floras along the New River were in progress. Deep-well drilling is mentioned under Pennsylvania.

Wyoming.—Areal and structural geologic mapping of portions of Park and Hot Springs Counties on the west side of the Big Horn Basin, with particular reference to coal and petroleum resources, and a study of the coal, oil, and gas resources of portions of the northeast side of the Big Horn Basin in Big Horn County, Wyo., and Carbon County, Mont., were in progress. Further investigations of the Tertiary rocks of the Green River and Bridger Basins and Fossil syncline and of the geology and mineral resources of the Afton quadrangle were begun. Reports on the geology and oil and coal resources of the Cody-Pitchfork area, the geology of the northeastern part of Big Horn Basin, and the geology of the Shoshone area, Park County, were in preparation. Work on the Randolph quadrangle is men-

tioned under Utah; on the Black Hills rim, on the Fort Union and associated formations, and on the physiography and glacial geology, under Montana.

General studies.—General investigations included studies of types and ranks of coal; source beds of petroleum; salt-dome cap rock; Foraminifera of the Cretaceous formations of the Gulf coastal region; Globigerinidae; the genus *Ceratopea*; fossils from the Eocene of the Gulf Province; borderland problems of geology, physics, and chemistry; clay minerals; deep-sea cores collected in 1936 across the North Atlantic Ocean; and a core sample from the deep-sea bottom southeast of New York City.

WORK IN CHEMISTRY AND PHYSICS

Work in chemistry and physics applied to geology is designated geochemistry and geophysics. Much of the chemical work in the Survey consists necessarily of analyses to determine the composition of the rocks, ores, and minerals involved in projects under study by geologists, and the remainder deals with the particular problems of geochemistry. These problems are to determine the abundance and distribution of different chemical elements in the crust of the earth, to explain the origin of natural products, including gases and ores, to classify rocks and minerals, and to describe the decomposition of rocks under weathering agencies. The physical work deals with the physical properties of minerals or of strata in place, such as their thermal or electrical conductivity, their temperature, their porosity, grain size, radioactivity, and compressibility.

The discovery of isotopes—that is, elements of similar chemical properties but of different physical properties—has considerably enlarged the field for chemical and physical study, particularly as related to geology. The results may affect the estimation of geologic time based on the transformation of one element into another, as such estimates require that the particular isotopes undergoing change be determined rather than the total quantities of the elements involved. This field is being developed as rapidly as possible. The use of X-rays, likewise, is now required to explain the real atomic structure of minerals, and hence their physical properties and chemical behavior.

Among materials analyzed in the laboratory during the year were clays from California and other States, alunite from Utah, oil from New Mexico, mercury ore from Kansas, silver ore from Idaho, phosphate rock from California, ocean-bottom samples from the North Atlantic, garnet from North Carolina, alkali brine from Wyoming, and silicate rocks and limestone from many different States. Complete analyses were also made of the minerals actinolite, allanite, biotite, feldspar, graftonite, halloysite, prehnite, rhodochrosite, samarskite, and sodalite. Several drill cores were examined and well cuttings logged. Spectrographic tests were made on different minerals and ores. Crystallographic measurements were made of a number of unusual minerals.

Altogether 4,576 examinations or tests of minerals and rock samples were made. These included tests and identifications of 1,570 specimens for persons not officially connected with the Survey; 1,587 chemical analyses made for geologists and 615 similar analyses made in connection with studies of methods of analysis and geochemical investigations; and 804 tests relating to core samples, well cuttings, and similar materials.

Special mineralogic work included the analysis of several varieties of zinc carbonate (smithsonite). "Fairy stones" from Virginia were investigated; only the altered crystals are usable commercially, as ornaments. The investigation of the stability relations of sodium and ammonium borates was continued with reference to their geologic occurrence. Many samples of garnet, lepidolite, and spinel were purified and prepared for analysis, 16 rocks and minerals from Guam were identified, and 20 crystals of quartz from Arkansas were measured and rare faces and unusual combinations determined.

Among the more important items of work in physics were the testing of activable bleaching clays in several States and geothermal surveys of wells in Oregon and southeastern Illinois. The investigation of bleaching clays has led to a rationalization of that industry. At least two deposits previously extensively surveyed by numerous tests are now in commercial production, and other deposits have been found which will eventually effect a more economical use of the raw materials available.

Dam sites in Oregon were surveyed by electrical conductivity methods.

The geothermal surveys in the lava beds of Oregon revealed the possibility of water-bearing beds of unusual thickness. From the data of existing geothermal surveys, it was estimated roughly that a temperature of 1,000° C. (1,832° F.) would be found at a depth of about 30 miles (48 kilometers) in the crust of the earth.

Many correlations of the physical properties of minerals with their chemical composition were completed during the year, which will make future determinations more rapid and more exact.

The work in chemistry and physics is mainly confined to laboratory investigations. However, field trips were made in New York, Pennsylvania, Virginia, North Carolina, South Carolina, Georgia, Tennessee, Ohio, Illinois, Utah, Wyoming, and Oregon, and papers were presented at regular meetings of the American Chemical Society, the Society of Economic Geologists, the American Geophysical Union, Geological and Mineralogical Societies in Ohio, the American Institute of Mining Engineers, the Virginia Academy of Sciences, and the American Association of Petroleum Geologists.

The following papers were completed during the year:

Fahey, J. J. Determination of mercurous chloride and mercury in mercury ores: Ind. Eng. Chemistry, analytical ed.

Fahey, J. J., with J. J. Glass. Graftonite from Greenwood, Maine: Am. Mineralogist.

Milton, Charles. Contributions to the petrology of the Franklin Furnace quadrangle, New Jersey: Jour. Geology.

Milton, Charles. Open hearth slags (preliminary paper): Am. Inst. Min. Met. Eng. 19th Open Hearth Proc.

Murata, K. J. Hydrogen ion concentration and the formation of copper complexes: Washington Acad. Sci. Jour.

Nutting, P. G. Study of bleach-clay solubility: Am. Assoc. Petroleum Geologists Bull.

Schaller, W. T. Lithium: Industrial Minerals, vol. 2, Am. Inst. Min. Met. Eng.

Schaller, W. T. Borates: Idem.

Schaller, W. T. Crystallography of valentinite and andorite from Oregon: Am. Mineralogist.

Stevens, R. E. Bibliography of reagents for potassium, rubidium, and cesium: Am. Chem. Soc. Jour.

Stevens, R. E., with F. L. Hess, Rare alkali biotite from Kings Mountain, N. C.: Am. Mineralogist.

Stevens, R. E., with J. T. Pardee and J. J. Glass, Low-fluorine topaz from Brewer mine, N. C.: Am. Mineralogist.

Van Orstrand, C. E. Temperatures in the lava beds of east-central and south-central Oregon: Am. Jour. Sci.; abstract: Washington Acad. Sci. Jour.

Van Orstrand, C. E. On the estimation of temperatures at moderate depths in the crust of the earth: Am. Geophys. Union Trans.; abstract, with additional notes: Science Service.

Wells, R. C., with R. E. Stevens. The analysis of pollucite: Ind. and Eng. Chemistry (read at spring meeting of Am. Chem. Soc., Chapel Hill, N. C.).

ALASKAN BRANCH

The work of the Geological Survey in Alaska is directed primarily toward aiding in the development of the mineral resources of the Territory and involves field examinations of the various factors that pertain to these resources, and laboratory and office studies by which the field observations are analyzed and the results made available to the public through reports, maps, and other media. The product of this work is used extensively by Government organizations engaged in other special fields of investigation within Alaska, such as the Forest Service, the Alaska Road Commission, and the Biological Survey. The Survey's maps of Alaska are indispensable in any enterprise concerned with the development of the Territory.

Manuscripts and publications.—During the year seven reports and five maps, including two new editions and two reprints, and four memoranda for the press have been published. Nine reports including maps, one separate map, and reprints of four maps are in course of publication. In addition three manuscript

reports, including maps, are in various stages of preparation for publication. At the end of the year one manuscript report and three maps were partly completed.

Work of the year.—In addition to the routine duties of serving as a central station, seven projects involving new field investigations were carried on during the season of 1936. These field projects included four that were directed primarily to the geologic phases of the investigation of the Territory's mineral resources, two that were primarily topographic, and one that was a general study of recent mining developments in the principal producing camps of the Territory. The areas in which the principal new geologic projects were undertaken were the Glacier Bay district, in the northwestern part of southeastern Alaska; the Alaska Range region, including especially portions of the valleys of the Slana, Tok, and Robertson Rivers; the region adjacent to the Alaska Railroad, including some of the mining camps as remote from that general tract as the Nuka Bay district, in the extreme southern part of Kenai Peninsula, or the quicksilver showings in the Kuskokwim River Valley near Sleitmut; and the mining developments in the Eagle, Fortymile, and Circle districts, in the Yukon region not far from the international boundary. The general study included visits to many of the more important mining centers from southeastern Alaska to western Seward Peninsula, where such diverse deposits as gold placers, tungsten lodes, and tin placers were examined. The topographic projects included semidetailed mapping of extensive areas on Admiralty Island, in southeastern Alaska, and reconnaissance and exploratory mapping in the Alaska Range region at the head of the Copper River, including portions of the valleys of the Robertson and Gerstle Rivers and areas adjacent to the Richardson Highway in the valley of the Delta River and Donnelly Dome.

Two projects not directly involving new field work were the maintenance of a testing laboratory at College, Alaska, where mineral specimens sent in by prospectors can be identified or can be assayed and the results made available for the information of the general public, and the annual statistical canvass of the production of mineral commodities.

In the field season of 1936 the late passage of the Interior Department Appropriation Act for 1937 prevented full utilization of the open season, so that several of the parties were forced to delay beginning effective work until nearly the first of July. Similar conditions existed in 1937. As a consequence, for the field season of 1937 only three parties had been started prior to June 30, though others were organized as soon as practicable after funds became available. Two of the projects are concerned primarily with topographic mapping and one with geologic investigations. One of the topographic projects is in the Copper River region north of the highway between Slana and Nabesna and is planned to cover the tract east of Batzulnetas and north of the Nabesna River, in continuation of the mapping that has been in progress for the last 3 years in this general region. The other topographic project includes detailed mapping of the more productive portions of the known platinum-bearing areas in the vicinity of Goodnews Bay, near the mouth of the Kuskokwim River, followed by reconnaissance mapping of more remote parts of the district contiguous to those areas. The geologic project involves study of the known platinum-bearing areas adjacent to Goodnews Bay, with the view of determining the geologic facts as to the origin and character of the mineralization by which the valuable metals were introduced into the country rock, the processes that have subsequently acted on these deposits so as to produce workable placers, the character of the platinum minerals, and the distribution and extent of the deposits that may warrant commercial exploitation.

Among the additional field projects authorized to be undertaken are a geologic examination of the northern and western part of Admiralty Island, in southeastern Alaska, an area that is now yielding gold from its lodes and that may contain

significant deposits of nickel-bearing ores, and a general study of recent mineral developments in the larger, more accessible, mining camps throughout the Territory.

TOPOGRAPHIC BRANCH

GENERAL OFFICE WORK

Necessary office work incidental to the field work of the topographic branch consisted in the inking, inspection, and editing of the completed topographic field sheets prior to their submission for reproduction and the computation and adjustment of the results of control field work.

In addition to the routine adjustment of primary control, there has been in progress a general adjustment of both horizontal and vertical control to agree with the standard datums of the United States.

During the year 157 new topographic maps were edited and transmitted for engraving. Editing was also completed on 753 miscellaneous maps, making a total of 910, and 1,848 proofs of maps in course of publication were read.

On June 30, 322 new maps were in preparation for reproduction and 239 were in process of engraving and printing.

In addition to the work incidental to the field work of the branch the compilation of planimetric maps from aerial photographs amounted to 2,765 square miles.

For the conservation branch of the Survey the work of inking, assembling, and preparing for publication was done on 78 maps of river surveys. Twelve such maps were completed and transmitted for lithography during the year.

For the Tennessee Valley Authority the work of inspection and preparing for lithography was done on 450 maps and 561 proofs were read.

For the Bureau of Public Roads the work of preparing the Transportation Map of the United States was continued. Compilation and inking were in progress on 48 sheets, 10 of which were completed. Proofreading and checking was done on 31 sheets. Maps of 5 States, comprising 18 sheets, were published.

FIELD SURVEYS

Abbreviations for projects used below: Federal Emergency Administration of Public Works, "P. W."; Tennessee Valley Authority, "T. V. A." Cooperation with States was continued in about the same amount as in recent years. Topographic surveys were accomplished in 36 States and in Puerto Rico. The mapping of Los Angeles County, Calif., on a large scale was completed.

The status of topographic surveys shows that the United States is now 47.4 percent mapped, the year's increment amounting to 0.3 percent.

Alabama.—In preparation for geologic mapping, Greasy Cove project completed.

Arizona.—At the request of the Office of Indian Affairs, Silver Bell No. 3 15' quadrangle completed. Payson No. 4 15' quadrangle continued at the request of the Forest Service. In preparation for geologic mapping, Aravaipa No. 2 15' quadrangle begun.

Arkansas.—In cooperation with the Geological Survey of Arkansas, Blake-more 15' quadrangle begun. Poteau Mountain No. 1 15' quadrangle begun at the request of the Forest Service. Benton No. 4 15' quadrangle (P. W.) begun.

California.—In cooperation with the State engineer of California, Tobias Peak 30' quadrangle and Avenal 15' quadrangle completed. In cooperation with the county surveyor of Los Angeles County, Crystal Lake, Mount Baden-Powell, Swarthout, and Mount Waterman 6' quadrangles completed. Kramer No. 1, Kramer No. 2, and Kramer No. 4 15' quadrangles (P. W.) completed. In preparation for geologic mapping, Downieville No. 1 15' quadrangle begun.

Colorado.—East Denver 2c and East Denver 3b 7½' quadrangles completed. Mapping without contours from aerial photographs completed for West Denver 4a 7½' quadrangle and continued for West Denver 1d 7½' quadrangle in cooperation with the city of Denver. In cooperation with the Colorado Metal Mining Fund, Ward-Sunset mining area begun. In preparation for geologic mapping, Platoro mining area and Summitville mining area completed and Gold Hill area begun. Chattanooga mining area (east), Chattanooga mining area (west), Chattanooga mining area (Ophir and vicinity), Chattanooga mining area (Alta Basin and vicinity) and Chattanooga mining area (Hanson Peak and vicinity) completed (P. W.). At the request of the Forest Service, Bardine No. 2 15' quadrangle begun. Great Sand Dunes National Monument begun for the National Park Service.

Florida.—St. Augustine 15' quadrangle (P. W.) completed.

Georgia.—For the Forest Service, Spring Place 15' quadrangle begun. East Ridge 7½' quadrangle continued, and Fort Oglethorpe and Coosa Bald 7½' quadrangles (T. V. A.) begun.

Idaho.—For the Forest Service, Boehls Butte 15' quadrangle and Newport 30' quadrangle completed. At the request of the Office of Indian Affairs, Pocatello No. 2 15' quadrangle continued. Logan No. 3 and Yellow Pine No. 2 15' quadrangles (P. W.) continued. In preparation for geologic mapping, Wallace special area begun.

Illinois.—Ashmore 15' quadrangle (P. W.) completed. Lena and New Douglas 15' quadrangles continued, and Oilfield, Alto Pass, and Monticello 15' quadrangles begun in cooperation with the Department of Registration and Education of Illinois, Geological Survey.

Louisiana.—The Louisiana Board of State Engineers cooperating, mapping without contours from aerial photographs completed for 7½' quadrangles within De Ridder, Juanita, Lees Mill, Starks, and Mystic 15' quadrangles.

Maine.—For the Forest Service, Gorham 15' quadrangle completed.

Massachusetts.—In cooperation with the Department of Public Works, Division of Waterways, Blue Hills, Norwood, Mansfield, Brockton, Onset, Woods Hole, 7½' Falmouth, Marion, 7½' New Bedford, Apponagansett, Sconticut Point, Northfield, Millers Falls, and 7½' Middleboro 7½' quadrangles completed and Warwick No. 1, Warwick No. 4, Middleboro No. 1, and Middleboro No. 3 7½' quadrangles begun.

Michigan.—In cooperation with the State Highway Department of Michigan, Smiths Creek and Goodells 7½' quadrangles begun and mapping without contours from aerial photographs completed for Marine City, Algonac No. 2, Algonac No. 3, Algonac No. 4, Lake Orion, Romeo, Ray Center, Richmond, Dundee

No. 1, Dundee No. 4, Grosse Pointe No. 2, Grosse Pointe No. 3, Smiths Creek, Goodells, Adair, Rattle Run, Davisburg, Milford No. 1, Wixom, Monroe No. 1, Monroe No. 2, Monroe No. 3, Monroe No. 4, New Haven, Waldenburg, Mount Clemens No. 3, Selfridge Field, Pontiac No. 1, Pontiac No. 2, Pontiac No. 3, Pontiac No. 4, Port Huron, St. Clair, Romulus No. 1, Romulus No. 2, Romulus No. 3, Romulus No. 4, Washington, $7\frac{1}{2}'$ Rochester, Rochester No. 3, Rochester No. 4, Ortonville, Oxford, South Lyon No. 1, South Lyon No. 2, Redford, Wayne No. 2, Wayne No. 3, Wayne No. 4, Wyandotte No. 2, Wyandotte No. 3, Ypsilanti No. 1, Ypsilanti No. 4, and Estral Beach $7\frac{1}{2}'$ quadrangles and begun for Detroit No. 1, Detroit No. 2, Detroit No. 3, and Detroit No. 4 $7\frac{1}{2}'$ quadrangles.

Mississippi.—In preparation for geologic mapping, Terry $15'$ quadrangle completed.

Missouri.—In cooperation with the Geological Survey and Water Resources of Missouri, Bradleyville, Elmer, Edgar Springs, Fielden, Franks, Hannibal, Springfield 3 S. $\frac{1}{2}$ $15'$ quadrangles and Tiffin, Springfield 3b, and Warsaw 2c $7\frac{1}{2}'$ quadrangles completed; Big Pincy, Bolivar No. 2, Fordland, Gatewood, Long Lane, Middlebrook, Protom, Richland, Springfield No. 4, Topaz, Vienna, Warsaw No. 3, and Warsaw No. 4 $15'$ quadrangles continued; Bolivar No. 1, Cabool, Cedar Gap, Doniphan, Exeter, Knoblick, Louisiana No. 4, Macomb, Mountain, Noel, and Raymondville $15'$ quadrangles and De Soto SW. $\frac{1}{4}$, Manchester NW. $\frac{1}{4}$ and Springfield 4b $7\frac{1}{2}'$ quadrangles begun. Warsaw 3b $7\frac{1}{2}'$ quadrangle (P. W.) completed.

Montana.—Silvertip $30'$ quadrangle (P. W.) completed.

Nebraska.—For the National Park Service, Scotts Bluff National Monument completed.

Nevada.—For the Forest Service, Mountain City $15'$ quadrangle completed. In preparation for geologic mapping, Mineral Hill No. 4 $15'$ quadrangle begun.

New Hampshire.—For the Forest Service, Gorham $15'$ quadrangle completed.

New Mexico.—In preparation for geologic mapping, Taos $30'$ quadrangle completed. At the request of the National Park Service, Bandelier National Monument completed. Jemez No. 1 $15'$ quadrangle begun for the Forest Service.

New York.—Poughkeepsie and West Point $15'$ quadrangles and Tarrytown No. 1 $7\frac{1}{2}'$ quadrangle completed in cooperation with the Department of Public Works of New York. Binghamton No. 4 and Saratoga No. 2 $7\frac{1}{2}'$ quadrangles (P. W.) completed.

North Carolina.—Blowing Rock $15'$ quadrangle (P. W.) completed. Hayesville $7\frac{1}{2}'$ quadrangle (T. V. A.) completed and Peachtree and Andrews $7\frac{1}{2}'$ quadrangles (T. V. A.) begun.

North Dakota.—In preparation for geologic mapping, Lake Upsilon $15'$ quadrangle completed. McVile $15'$ quadrangle (P. W.) completed.

Oklahoma.—At the request of the Forest Service, Cache $15'$ quadrangle and Cache No. 2 $7\frac{1}{2}'$ quadrangle completed.

Oregon.—In preparation for geologic mapping, Troutdale $15'$ quadrangle completed. For the Forest Service, Mapleton $15'$ quadrangle continued.

Pennsylvania.—In cooperation with the Department of Internal Affairs of Pennsylvania, Topographic and Geologic Survey, Mattawana, Marienville, and Delaware Water Gap $15'$ quadrangles completed and Slatington and Coburn $15'$ quadrangles begun.

Puerto Rico.—In cooperation with the Commissioner of the Department of the Interior of Puerto Rico, San German, Puerto Real, and Sabana Grande $7\frac{1}{2}'$ quadrangles completed, Moca and Aguadilla $7\frac{1}{2}'$ quadrangles begun.

South Carolina.—In preparation for geologic mapping, Nixonville and Myrtle Beach $15'$ quadrangles completed.

Tennessee.—Oswald Dome 7½' quadrangle (T. V. A.) completed and East Ridge, Charleston, Wauhatchie, Calhoun, East Chattanooga, Fort Oglethorpe, Hooker, 7½' Chattanooga, Goodfield, Riceville, Parksville, Caney Creek, and Benton 7½' quadrangles (T. V. A.) begun. For the Forest Service, Spring Place 15' quadrangle begun. Mapping without contours from aerial photographs completed for Lyles, Texas Hollow, Nunnelly, and Littlelot 7½' quadrangles (T. V. A.) completed.

Texas.—In preparation for geologic mapping, Tyler No. 4 15' quadrangle completed. Tyler No. 1 15' quadrangle (P. W.) begun.

Utah.—In preparation for geologic mapping, the revision and extension of Cottonwood quadrangle completed. At the request of the National Park Service, Cedar Breaks National Monument completed. For the Forest Service, Delano Peak No. 2 15' quadrangle begun.

Vermont.—In cooperation with the State geologist of Vermont, Barnet 15' quadrangle continued.

Virginia.—Gerrardstown and Capon Bridge 15' quadrangles completed and Middletown and Stephens City 15' quadrangles begun in cooperation with the Conservation and Development Commission of Virginia, Geological Survey.

Washington.—In cooperation with the Director of the Department of Conservation and Development, Union Gap and Hog Ranch Buttes 15' quadrangles completed. For the Forest Service, Newport 30' quadrangle completed and Pomeroy 30' quadrangle begun. Marcus 30' quadrangle (P. W.) completed.

West Virginia.—Culture revision begun for Wellsville 15' quadrangle (P. W.).

Wisconsin.—Arkansaw 15' quadrangle (P. W.) completed.

Wyoming.—Cokeville 30' quadrangle (P. W.) completed and La Barge 30' quadrangle (P. W.) continued. For the Forest Service, Leckie No. 1 15' quadrangle begun.

WATER-RESOURCES BRANCH

The importance of water and of systematic records related to the quantity, chemical quality, and availability of both surface and ground waters becomes greater each year. The growth of the country in population and industry, with consequent increases in demands for water, and especially the continued series of dry years that included the disastrous and widespread droughts of 1934 and 1936, and the recent disastrous floods in different parts of the country, have impressed on the people the controlling importance of water in our surface streams and in underground basins in relation to many of man's activities. The information collected by the Geological Survey is used extensively by many Federal, State, and private agencies. The Public Works Administration, the National Resources Committee, and related activities have found the Survey records and information with respect to water to be invaluable in studies of projects of all classes and in all sections of the country.

Reliable information with respect to supplies of water, both on the surface and in the ground, and to their fluctuations with variations in rainfall is essential to orderly, sound, and economic development along many lines, as in domestic water supplies, irrigation, flood protection, control of pollution, recreational uses, and water-power development.

The investigations by the branch are conducted largely in cooperation with Federal bureaus; State, county, municipal, and other governmental agencies; and permittees and licensees of the Federal Power Commission. A major part of this cooperation is set forth below.

Federal bureaus.—Investigations of ground and surface water and of the quality of water were conducted for the following Federal bureaus:

Department of Agriculture:

Bureau of Biological Survey.

Bureau of Plant Industry.

Soil Conservation Service.

Weather Bureau.

Department of the Interior:

Office of Indian Affairs.

Bureau of Mines.

Bureau of Reclamation.

Division of Grazing.

National Park Service.

Division of Territories and Island Possessions.

Department of Justice; Bureau of Prisons.

Department of State.

Federal Power Commission.

National Resources Committee.

Resettlement Administration.

Tennessee Valley Authority.

War Department:

Office of Chief of Engineers.

Mississippi River Commission.

Schofield Barracks.

States.—Amounts aggregating approximately \$630,000 were made available by States and municipalities for cooperative investigations of surface water, ground water, and quality of water. In addition to the data obtained as a result of this cooperation, other data having an estimated value of over \$140,000 were furnished by individuals and other organizations.

Permittees and licensees of the Federal Power Commission.—At the request of the Federal Power Commission, 30 engineers of the branch have been designated as representatives of the Commission to perform such field work as may be assigned to them by the Commission. The operation of about 290 gaging stations was conducted by the branch or was performed by permittees and licensees under the supervision of the branch in connection with 115 projects of the Federal Power Commission. Engineers of the branch have had general supervision of operation under permits and licenses of the Federal Power Commission in connection with 150 projects.

Division of Surface Water.—The division of surface water conducts investigations of surface water, which consist of the measurement of

the flow of rivers in the 48 States, the District of Columbia, and Hawaii at selected gaging stations where the volume of water is measured and records of stage and other data are collected. In this work 45 States, the Territory of Hawaii, several Federal bureaus and several individuals cooperated in the maintenance of the 3,379 regular gaging stations that were in operation at the end of the year. Records for about 108 additional gaging stations were received from Federal bureaus and from individuals. There were 47,398 regular and miscellaneous discharge measurements made during the year.

Division of Ground Water.—The division of ground water investigates the waters that lie below the surface of the zone of saturation (from which wells and springs are supplied); the source, occurrence, quantity, and head of these waters; their conservation; their availability and adequacy for domestic, industrial, irrigation, and public supplies and as watering places for livestock and desert travelers; and the methods of constructing wells and recovering water from them and of improving springs. Each year surveys are made of selected areas where problems of water supply are urgent, and the results are prepared and released to the public. Each year a water-supply paper is published that gives the current records of water levels or artesian pressure in observation wells in different sections of the country. During the fiscal year 75 technical reports or papers relating to ground water or reservoir sites were released to the public. Work was done in 30 States and in Guam and in Hawaii. Nearly all the work was done in cooperation with Federal, State, Territorial, or local governmental agencies.

Division of Quality of Water.—The division of quality of water analyzes water from surface and underground sources with reference to the suitability of the waters for industrial and agricultural uses and for domestic use (not related to questions of health), so far as use is affected by the dissolved mineral matter. The partial or complete analysis of 1,754 samples of water was completed during the year. Close cooperation was continued with the division of ground water in the study of problems relating to quality of ground water and the preparation of the parts of ground-water reports that involve consideration of the chemical character of the waters.

Division of Power Resources.—The work of the division of power resources comprised the compilation and publication of the annual report on the capacity of water wheels in water-power plants in the United States of 100 horsepower or more on January 1, 1937. The report was released in April. The report on the capacity of water wheels January 1, 1938, will be prepared and published by the Federal Power Commission. The compilation and publication of the monthly and annual reports of the production of electricity for public use and the consumption of fuel in generating the electricity reported, which

had been done by the power-resources division from 1919 to 1936, were transferred to the Federal Power Commission on July 1, 1936. A study is being made of the records of power production from 1920 to 1935. These studies are based on the records compiled by the Geological Survey and published by the Federal Power Commission as Power Series No. 6 of the National Power Survey.

Division of Water Utilization.—The division of water utilization investigates problems affecting the utilization and control of the waters of streams, makes studies for the interpretation of records of stream flow, and performs administrative work relating to supervision and investigation of these problems and to activities conducted by the field organization of this branch pertaining to power projects of the Federal Power Commission and of the Interior Department. The division supervised and coordinated the collection by the district offices of the division of surface water of special stage and discharge information relative to the outstanding floods of March 1936 in the Northeastern States and to notable floods in Texas. The division assembled these flood data, together with data for other recent notable floods, and prepared reports thereon for publication as water-supply papers. The reports that were completed during the year are listed below:

Water-Supply Paper 796-B. Flood on the Republican and Kansas Rivers in May and June 1935, by Robert Follansbee and J. B. Spiegel.

Water-Supply Paper 796-C. The New Year's flood of 1934 in La Cañada Valley, California, by H. C. Troxell and J. Q. Peterson.

Water-Supply Paper 798. Floods of March 1936, Part 1, New England rivers.

Water-Supply Paper 799. Floods of March 1936, Part 2, Hudson River to Susquehanna River region.

Water-Supply Paper 800. Floods of March 1936, Part 3, Potomac, James, and upper Ohio Rivers.

Water-Supply Paper 816. Major floods in Texas in 1936, by Tate Dalrymple and others.

The Division has been active during the year in investigations of water problems along the international boundary between the United States and Canada for the State Department and also in the collection of information on recent outstanding floods in the Ohio and Mississippi Valleys.

CONSERVATION BRANCH

The work of the Conservation Branch involves surveys and investigations precedent to an inventory of the water and mineral resources of the public domain, supervision of private operations for development of power and production of minerals from public and Indian lands, and supplying information and advice to numerous land-administrative agencies of the Government.

The first of these activities remained nearly at a standstill for lack of funds for field explorations, but a small increase of appropriation

permitted better and quicker service to be given to land-administrative agencies, there being a decrease of 33 percent in cases pending at the end of the year, though the annual volume of work had increased 23 percent.

An increase in appropriations for mineral-lease supervision permitted reasonably prompt action to be taken on proposed plans for cooperative or unit development of oil fields and somewhat better supervision of production operations. At the end of the year 1,343 plans of development and operation had been received and only 42 of these were awaiting original technical consideration in the branch. The volume of work under field supervision, which has regularly shown an annual increment, again advanced materially. On public land alone 85 operating properties were added to the total number under supervision, production increased between 5 and 10 percent, and revenue increased to about \$6,300,000. The funds available have never been adequate for supervision of these vast operations, and during this year, as in other years, revenue far in excess of the appropriation has been lost because of inability to make timely inspection of field properties and make sure that operations are so conducted as to accomplish the greatest ultimate production and effective current beneficial use of the mineral resources involved.

In addition to their regular activities members of the Branch were engaged on related projects under the auspices of the Public Works Administration. Useful conservation work was thus accomplished, employees who otherwise must have been furloughed for lack of funds were continued in service, and emergency employment was given to many engineers, clerks, and laborers.

MINERAL CLASSIFICATION DIVISION

The work of the Mineral Classification Division, restricted largely to office procedure, although less than in previous years, was delayed in part by lack of geologic information due to scanty field investigations. The activities of the Division were directed in considerable part to determining the areas subject to inclusion in plans for unit or cooperative development submitted by holders of Government oil and gas prospecting permits and leases.

In the aid of mineral classification pertinent information relating to the occurrence of carbon dioxide gas in California, New Mexico, and Utah; of coal in Montana, New Mexico, Utah, and Wyoming; of oil and gas in Alabama, Arkansas, Colorado, Florida, Kansas, Louisiana, Mississippi, Montana, New Mexico, Oklahoma, South Dakota, Utah, and Wyoming; and of phosphate in Wyoming was obtained either by the personnel of the Mineral Classification Division or through the geologic branch.

In the routine work of the Division, 8,937 cases requiring technical consideration were disposed of during the fiscal year.

In addition to the preceding work, revisions of the definitions of the known geologic structure of two producing oil and gas fields were prepared and promulgated as follows:

Definitions of Known Geologic Structure, Fiscal Year 1937

State	Field	Date promulgated	Acres
New Mexico.....	Eaves.....	Apr. 10, 1937.....	8,074
Wyoming.....	Rex Lake.....	Apr. 5, 1937.....	1,280

The aggregate area of the outstanding definitions of the known geologic structure of oil and gas fields on June 30, 1937, amounted to 1,155,253 acres in California, Colorado, Montana, New Mexico, North Dakota, Oklahoma, Utah, and Wyoming.

WATER AND POWER DIVISION

The work of obtaining basic information as to the water-power resources and storage possibilities of public lands and of making it available for use in the administration of public-land laws and by Federal and other agencies engaged in planning, constructing, and operating water-power projects was continued in the field, being made possible by the extended availability of Public Works funds. River-utilization surveys covering 1,261 miles of important streams and tributaries were made in 11 public-land States. Surveys of reservoir and dam sites embracing an area of 155 square miles were also completed. Supplemental geologic and geophysical studies of foundation materials and conditions were made at 61 dam sites.

Office activities included action resulting in the addition of 100,699 acres to outstanding water-power reserves in 12 public-land States and the elimination of 17,507 acres from such reserves in 7 States, with a net increase of the total reserved area in 22 States to 6,583,439 acres. The elimination of 260 acres from reservoir-site reserves left a net total of 133,444 acres withdrawn. One restoration of lands withdrawn under the act of October 2, 1888, was also made. Field supervision of power projects for the Federal Power Commission involved investigations and reports on 9 projects, supervision of construction and operation on 148 projects, and studies of cost accounting on 9 projects. Field supervision of power projects holding permits and grants from the Interior Department involved 172 projects, making a total of 320 projects for the Interior Department and the Federal Power Commission.

Statistics compiled by the division show that the holders and users of rights of way granted by the Secretary of the Interior for power

purposes had, for the calendar year 1936, an aggregate installed capacity of 4,852,841 horsepower, including 3,300,704 horsepower at hydraulic plants and 1,552,137 horsepower at fuel plants, and an aggregate energy generation of 11,468,380,623 kilowatt-hours, which is an increase of 44 percent over the production in the next preceding year. The energy generated by water power increased 3,118,916,918 kilowatt-hours, or about 45 percent, and that generated by fuel increased 388,074,113 kilowatt-hours, or about 38 percent. Revenues accrued to the Government from these grants aggregated \$236,211 from 1912 to 1936, and \$12,814 additional has been assessed for the calendar year 1937. Payments for unauthorized occupancy of public lands by power projects prior to the issuance of license therefor by the Federal Power Commission amount to \$101,633 additional.

MINING AND OIL- AND GAS-LEASING DIVISIONS

The work of the mining and oil- and gas-leasing divisions consists of inspectional and regulatory supervision of mineral prospecting and development on public lands, Indian lands, and naval petroleum reserves.

The mining division is charged with supervision of all operations for the discovery and development on public lands of deposits of coal, phosphate, sodium, potassium, and oil shale; in New Mexico and Louisiana of sulphur; on certain land grants of gold, silver, and mercury; and on restricted allotted and tribal Indian lands of all minerals except oil and gas. This supervisory and regulatory work during the fiscal year was accomplished through six field offices in Colorado, Montana, New Mexico, Oklahoma, and Utah, and through a cooperative agreement approved May 4, 1935, with the Department of Mines, Territory of Alaska.

The work of the Oil and Gas Leasing Division includes inspectional and regulatory supervision of all operations for the discovery and development of petroleum and natural gas on public lands of the United States, on naval petroleum reserves, and on all Indian lands subject to departmental jurisdiction, both tribal and allotted, except the Osage Reservation, Okla. The work was accomplished in the fiscal year 1937 through the agency of 13 field offices and sub-offices at Taft, Calif.; Roswell and Farmington, N. Mex.; Tulsa and Oklahoma City, Okla.; Wichita Falls, Tex.; Denver, Colo.; Casper, Midwest, and Thermopolis, Wyo.; Billings and Shelby, Mont.; and Salt Lake City, Utah.

Public lands.—The number of public-land properties under supervision of the Oil and Gas Leasing Division increased 8.6 percent, to a total of 9,052, involving 12,485,167.59 acres in 17 States and Alaska.

With the aid of funds allotted by the Public Works Administration the Division was enabled to continue important conservational and

remedial measures through the proper plugging and conditioning of many old abandoned wells. The results of this work are outlined more fully under the heading "Public Works projects."

A substantial part of the time of the personnel of the Division was devoted to assisting oil and gas permittees in fulfilling departmental requirements for the submission of unit or cooperative plans of operation and development involving permit acreage, and to reviewing and revising the engineering and royalty features of such plans after their submission. At the end of the fiscal year 1937 a total of 1,343 plans of unit or cooperative development for oil or gas pools, fields, or areas involving public land had been filed with the Geological Survey, of which 47 had been given final approval by the Secretary of the Interior, 1,145 had been rejected, withdrawn, or suspended, 201 had been reviewed and returned to their proponents for revision and consummation, and 161 were pending final action, including 42 which were awaiting technical consideration in the Conservation Branch.

The Oil and Gas Leasing Division formulated the revised oil and gas operating regulations, effective November 1, 1936, which established a uniform basis of regulation for the development and production of the oil and gas resources on reserved and unreserved public lands of the United States, including naval petroleum reserves, and on all restricted Indian lands, tribal and allotted, except those of the Osage Indian Reservation.

Drilling activity on public lands during the fiscal year 1937 included the commencement of 333 new wells and the completion of 344 wells, of which 257 were rated as productive of oil and gas and 87 as barren. The total number of wells under supervision on June 30, 1937, was 7,934 in 17 States and Alaska, including 4,112 capable of oil or gas production. The production of petroleum, natural gas, and natural gasoline from public lands in 1937 was substantially greater than in other recent years, and the revenues accrued therefrom were materially increased.

Coal properties under supervision in 14 States and Alaska decreased 37, to 657; potash properties in 8 States decreased 56, to 39 in 3 States; sodium properties in 9 States increased 4, to 44; sulphur properties in 1 State decreased 8, to 18; phosphate properties increased 2, to 11; and the oil-shale lease remained at 1 in 1 State. The total number of properties under supervision was 770, a decrease of 95, substantially all of which were inactive. The reduction in coal properties resulted indirectly from the Secretary's instructions of January 24, 1934, and that in potash properties from the Secretary's orders 799, 817, 854, and 914, all of which tended to slow down the issuance of new permits and leases. In prospecting for the above-named minerals 16 bore holes were drilled during the year.

Accidents to employees working in mines under departmental leases are generally fewer than in competitive mines not on Government lands, and it is gratifying to note that of the 33 awards made to coal mines or to operators by the Joseph A. Holmes Safety Association for the calendar year 1936 two were made to departmental lessees. The use of safety appliances and safety clothing is increasing generally throughout mines on Government lands.

Indian lands.—The Secretary's order 1112, approved September 4, 1936, which relates to oil and gas operations and which constitutes a new cooperative agreement between the Geological Survey and the Office of Indian Affairs, extended the cooperative technical supervision and the royalty-accounting duties of the Geological Survey to embrace all tribal and restricted allotted lands within the limits of all Indian reservations except the Osage Nation. Oil and gas supervision involved 5,342 leaseholds, 4,463 wells, and aggregate bonus, royalty, and rental accruals estimated at \$2,665,000 for Indian beneficiaries in 10 States and 30 different tribes. The cooperative duties involved royalty accounting, appraisals of bonuses, royalty offers, and pollution damages, assistance to lessees of Indian land on operating problems and in the preparation of unit plans of development, and assistance to agency officials and tribal councils on technical phases of leasehold development and administration.

Mining supervision involved 40 lead and zinc leaseholds in the Quapaw Reservation, Okla., with aggregate royalty accruals of \$568,299.94, an increase of 57.54 percent from the preceding year; 57 coal leaseholds involving Choctaw, Chickasaw, and Five Tribes lands in Oklahoma, with an aggregate production decreased from 568,725.92 tons in 1936 to 527,579.75 tons in 1937; and revenue accruals from royalties, bonuses, and sale of coal lands amounting to \$89,308.31; one asphalt lease involving segregated Choctaw and Chickasaw lands in Oklahoma; and 51 properties in other States, 18 of which are agency mines. It included also special investigations of 18 properties for minerals other than fuels.

Naval petroleum reserves.—On behalf of the Navy Department supervision was continued during the fiscal year over operations for the production of oil and gas within Naval Petroleum Reserves Nos. 1 and 2, in California, and for the conservation of shut-in production within Naval Petroleum Reserve No. 3, in Wyoming. Production from 538 wells on the reserves aggregated 3,567,213.54 barrels of petroleum, 2,816,073,000 cubic feet of natural gas, and 11,076,165,000 gallons of natural gasoline and had an aggregate royalty value of \$787,906.64.

PUBLIC WORKS PROJECTS

Under the supervision of the conservation-branch personnel, aggregate expenditures of \$165,286.47 were made during the fiscal year 1937 from funds allotted by the Administrator of Public Works for field investigation in conservation work pertinent to branch functions. On 11 projects \$109,423.36 was expended for river-utilization surveys of power and storage resources of important streams in 11 States. On 12 projects \$55,863.11 was expended in 9 States in the plugging and abandonment or conditioning for use as a source of water of numerous wells drilled for oil and gas on public lands and theretofore improperly abandoned or merely deserted; in extinguishing or controlling coal-outcrop fires and in filling, bulkheading, or otherwise safeguarding abandoned mines or prospective openings on public and Indian lands; and in surface studies of coal occurrence and subsurface studies of oil and gas occurrence in Indian lands in Oklahoma.

SUMMARY OF FIELD ACTIVITIES, BY STATES

Alabama.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Examined 1 tract in Franklin County for purposes of mineral classification. Supervised 1 coal lease.

Alaska.—Supervised 1 power project, 144 prospecting permits for oil and gas, and 2 leases, 2 licenses, and 9 prospecting permits for coal.

Arizona.—Completed 162 miles of river-utilization surveys on Black Creek, the Little Colorado River, and the Rio Puerco, and surveyed in detail 44 square miles in the Cottonwood Wash, Leroux Wash, Lyman, and Zuñi reservoir and dam sites. Made geologic studies of foundation materials and conditions at 6 dam sites. Supervised 25 power projects, 72 prospecting permits for oil and gas, and 3 for coal, 6 for sodium, and 5 for potash on public land, and 4 coal mines on Indian land.

Arkansas.—Investigated oil and gas prospecting operations in northeastern and northwestern Arkansas in aid of mineral classification. Supervised 1 power project and 9 prospecting permits for oil and gas.

California.—Investigated occurrence of carbon dioxide gas in Brawley area, Imperial County. Completed 140 miles of river-utilization surveys on the Carson (including East and West Forks). Trinity, and Yuba (including Middle North and South Forks) Rivers and tributaries, and surveyed in detail 24 square miles in the Beno, Steiner Flat, Trinity Center, Fairview, and Bullards Bar reservoir and dam sites and the Silver Queen, Washington, Governor Stevens, and Spaulding dam sites. Supervised 89 power projects, 223 leases and 1232 prospecting permits for oil and gas on public land and 22 leases on Naval Petroleum reserves, 4 prospecting permits for coal and 23 for sodium, and 1 sodium lease and 2 potash leases.

Colorado.—Completed structural and stratigraphic investigations in the South Park area, Park County. In cooperation with the geologic branch made a reconnaissance investigation of land in southeastern Archuleta County. Completed 111 miles of river-utilization surveys on Buzzard Creek, the Gunnison River, the Little Snake River, Troublesome Creek, and the Yampa River and tributaries; and surveyed in detail 5 square miles in the Buzzard Creek, Columbus

Mountain, and East Fork reservoir sites and the Black Mountain, Middle Fork, North Fork, Stonewall, Three Forks, Walker, and Yampa Nos. 1, 2, 3, and 4 dam sites. Made geologic studies of foundation materials and conditions at 11 dam sites. Supervised 12 power projects, 32 leases, and 691 prospecting permits for oil and gas on public land and 5 oil and gas leases on Indian land; 90 leases, 13 licenses, 38 permits, and 9 awarded lease applications for coal, and 1 sodium lease on public land; and 2 Indian agency coal mines. Dug out and re-covered 2 coal-mine and outcrop fires in Rio Blanco County, under Public Works allotments.

Florida.—Investigated oil and gas prospecting operations throughout the State, including inspection of two drilling operations in Hillsborough County and one each in Lake and Nassau Counties.

Idaho.—Completed 90 miles of river utilization surveys on the North Fork of the Coeur d'Alene and Weiser Rivers and tributaries; and surveyed in detail the Leland Glen reservoir and dam site and the Bumble Bee, Evanville, Hultman Creek, Spion Kap, Teddy Creek, Brown, Lost Valley, and Squaw Flats dam sites. Supervised 32 power projects, 74 prospecting permits for oil and gas, 1 lease and 17 permits for coal, and 2 phosphate leases.

Kansas.—Investigated oil and gas prospecting operations in western Kansas in aid of mineral classification. Supervised 3 leases and 18 prospecting permits for oil and gas.

Louisiana.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification. Supervised 17 leases and 2 prospecting permits for oil and gas.

Mississippi.—Investigated oil and gas prospecting operations throughout the State in aid of mineral classification and examined 1 tract each in Attala, Choctaw, Leake, Montgomery, and Webster Counties.

Montana.—Examined land in the Rattlesnake Butte area, Petroleum County, for mineral classification. In cooperation with the geologic branch initiated structural and stratigraphic investigations in the Little Rocky Mountains area, Phillips and Fergus Counties. Completed 173 miles of river-utilization surveys on the Middle, North, and South Forks of the Flathead River and tributaries and surveyed in detail 14 square miles in the Glacier View and Big Prairie reservoir and dam sites. Supervised 38 power projects; 117 leases and 859 prospecting permits for oil and gas on public land; and 99 leases, 32 permits, and 45 licenses for coal; 7 phosphate leases; 47 oil and gas leases, 2 Indian agency coal mines, and 26 coal and 3 silver-lead-gold leases on Indian land; continued important conservation measures through the plugging and conditioning of abandoned oil wells under Public Works allotments.

Nevada.—Completed 17 miles of river surveys on the Carson River (including East Fork) and Marys River and made detailed surveys of the Heenan Lake, Silver King Nos. 1 and 2, Silver Queen, Soda Springs, Chalk Basin, and Hanks Creek dam sites. Supervised 24 power projects, 81 prospecting permits for oil and gas, 4 coal permits, 1 phosphate lease, 6 sodium permits, and 7 potash permits.

New Mexico.—Continued an areal, stratigraphic, and subsurface structural investigation in Lea County. In cooperation with the geologic branch initiated an investigation of coal and oil resources of the Lumbarton and Monero districts Rio Arriba County. Completed 158 miles of river utilization surveys on the Pecos River, Rio Chama, and San Juan River; surveyed Dead Man's Wash in connection with erosion studies; surveyed 16 square miles in Los Osteros, Cañon de Chama, El Vado, and Lower Abiquiu reservoir and dam sites; and made detailed surveys of the Tecolote and Los Osteros No. 2 dam sites. Made geologic studies of foundation materials and conditions at 5 dam sites and of Dead Man's Wash erosion area; continued operations in connection with plugging oil wells and reconditioning water wells under Public Works allotment. Supervised 3 power

projects; 193 leases and 1,862 prospecting permits for oil and gas on public land; 5 oil and gas leases on Indian land; 24 leases and 23 prospecting permits for coal; 9 prospecting permits for sodium; 9 leases and 70 prospecting permits for potash; and 44 sulphur permits. Supervised on Indian land 73 agency coal mines.

North Dakota.—Supervised 1 lease and 25 prospecting permits for oil and gas; 67 leases, 1 permit, and 18 licenses for coal; and 1 permit for sodium.

Oklahoma.—Investigated oil and gas operations in western Oklahoma for purposes of mineral classification. Supervised 3 power projects, 15 leases, and 93 prospecting permits for oil and gas on public land and 5,252 oil and gas leases on Indian land. Supervised on segregated tribal and restricted allotted Indian lands 33 leases, 21 permits, and 1 temporary mining permit for coal; 1 asphalt lease and 2 right-of-way leases; supervised on Quapaw Indian lands 40 zinc-lead leases.

Oregon.—Completed 131 miles of river-utilization surveys on the Applegate River, Chewaucan River, Deep Creek, Grave Creek, Hood River and tributaries, Nehalem River, and South Umpqua River; and surveyed in detail 5 square miles in the Lower Applegate and Paisley reservoir sites and the Alternate, Cranberry, State, Grave Creek, Elsie, Days Creeks, Shovely and Tiller dam sites. Made geologic and geophysical studies of foundation materials and conditions at 14 dam sites. Supervised 43 power projects, 134 prospecting permits for oil and gas, 1 lease and 4 prospecting permits for coal, 2 sodium permits, 3 potash permits, and 1 oil-shale lease.

South Dakota.—Initiated an areal and structural investigation in Butte and Harding Counties for purposes of mineral classification. Supervised 50 prospecting permits for oil and gas and 6 oil and gas leases on Indian land; 5 leases, 3 permits, and 1 license for coal on public land.

Utah.—Examined land in the Diamond Fork area, Utah County, for purposes of mineral classification. Investigated occurrence of carbon dioxide gas in the Farnham area, Carbon County. Continued stratigraphic and structural investigations in Washington County. In cooperation with the geologic branch initiated a structural and stratigraphic investigation of the Henry Mountains area, Emery, Garfield, and Wayne Counties, and of the Strawberry Valley quadrangle, Utah and Wasatch Counties. Completed 109 miles of river-utilization surveys on the Bear River, Sevier River, and Willard Creek and surveyed in detail 27 square miles in the Otter Creek and Piute reservoir and dam sites. Made geologic studies of foundation materials and conditions at one dam site; continued operations in connection with plugging oil wells and reconditioning water wells under Public Works allotment. Supervised 17 power projects; 25 leases and 884 prospecting permits for oil and gas on public land and 1 oil and gas lease on Indian land; 48 leases, 57 permits, and 2 licenses for coal; 11 sodium permits, 31 potash permits, and 1 phosphate lease.

Washington.—Completed 98 miles of river-utilization surveys on the Cispus, Cowlitz, Sauk, and Toutle Rivers and surveyed in detail 11 square miles in the Mossy Rock and Sauk reservoir sites and the Green River dam site. Made geologic and geophysical studies of foundation materials and conditions at 21 dam sites. Supervised 21 power projects, 12 prospecting permits for oil and gas, 1 lease and 14 permits for coal, 1 sodium permit; 3 silver-gold leases and 4 tungsten leases on Indian lands.

Wisconsin.—Supervised 1 power project.

Wyoming.—Examined land in the West Dewey area, Weston County, and the Smith Creek area, Carbon County, for purposes of mineral classification. In cooperation with the geologic branch continued phosphate investigations in northern Lincoln County; and structural and stratigraphic investigations in the Cody, Pitchfork, and Shoshone districts, Park County, and the east side of the

Big Horn Basin, Big Horn County. Through the geologic branch examined land in the Cottonwood Creek area, Park County, for purposes of mineral classification. Completed 72 miles of river-utilization surveys on the Bear River and Savery Creek and surveyed in detail 9 square miles in the Yellow Creek reservoir site and the Needles and Lower and Upper Savery Creek dam sites. Made geologic studies of foundation materials and conditions at 2 dam sites. Supervised 10 power projects, 477 leases and 1,707 prospecting permits for oil and gas on public land, 24 oil and gas leases on Indian lands, 56 leases, 60 permits, and 22 licenses for coal, 2 prospecting permits for sodium, and 1 permit for potash. Performed technical supervision at Emergency Conservation Camp 858, established for conserving coal deposits.

WORK ON PUBLICATIONS

Texts.—The book publications of the year numbered 57 and contained 5,760 pages. Besides these publications 30 brief papers in mimeographed form were issued as memoranda for the press. During the year 38,785 pages of manuscript were edited and prepared for printing, 1,397 galley proofs were read, and 6,385 page proofs were revised. Indexes were prepared for 39 publications, covering 6,310 pages. Copy and proof or stencils for 580 pages of multigraph or mimeograph matter were read. During the year 22 foreign letters, in German, French, Spanish, Italian, and Portuguese were translated.

Illustrations.—The section of illustrations prepared 2,213 drawings and photographs, transmitted 1,154 illustrations to accompany 44 reports, received and examined 569 proofs, and examined 82 edition prints.

Geologic map editing and drafting.—The geologic map of Texas, scale 1:500,000 was completed and published. This map is in four parts, each 50 by 40 inches, and is printed in 23 colors, with 108 map units represented by patterns. This map was prepared and drafted, the proof read, and the color printing directed in this section. A total of 213 illustrations, comprising geologic maps, sections, and diagrams, were drawn in the section, and illustrations for 27 papers were edited. Proofs of 18 geologic maps and sections were read.

Distribution.—A total of 353 publications, comprising 57 new books and pamphlets, 96 new or revised topographic and other maps, 199 reprinted topographic and other maps, and 1 geologic map, were received during the year. Several special pamphlets and forms for administrative use were also delivered and distributed. The total units of all publications received numbered 140,802 books and pamphlets and 673,590 topographic and other maps, a grand total of 814,392. The division distributed 101,827 books and pamphlets, 3,413 geologic folios, and 746,820 maps, a grand total of 852,060, of which 3,051 folios and 645,123 maps were sold. The net proceeds (gross collections less copying fees and amounts refunded) from the sales of publications were \$37,963.17, including \$37,136.32 for topo-

graphic and geologic maps and \$826.85 for geologic folios. In addition to this \$10,308.74 was repaid by other establishments of the Federal Government at whose request maps or folios were furnished. The total receipts, therefore, were \$48,271.91.

Engraving and printing.—During the year 70 newly engraved topographic maps including 4 revised maps, were printed, and 26 special maps, making a total of 96 new maps printed and delivered. Of the newly engraved maps 45 were completed under the Public Works allotment. Corrections were engraved on the plates of 413 maps. Reprint editions of 184 engraved topographic maps and 15 photolithographed State and other maps were printed and delivered. In addition, 81 new topographic maps had been engraved and were in press June 30, including 56 under Public Works allotment, and the engraving of 161 other new topographic maps was in hand, including 93 under Public Works allotment. One new geologic map was printed, the edition amounting to 4,550 copies. Of new and reprinted maps, 296 different editions, amounting to 673,590 copies, were delivered.

A large amount of work was done for 68 other units of the Government and State governments, and the charges for it amounted to about \$220,000, for which the appropriation for engraving and printing geologic and topographic maps was reimbursed.

Transfer impressions numbering 386 were made during the year and the amount turned over to miscellaneous receipts was \$179.90.

Of topographic maps, geologic maps, and contract and miscellaneous work of all kinds, a grand total of 3,441,687 copies were printed and delivered.

The photographic laboratory made 16,111 negatives (including 5,408 wet plates for photolithographs, 585 wet plates for photographic prints, 35 paper negatives, 3,010 dry plates, 471 lantern slides, 406 half-tone negatives, and 6,196 field negatives), 23,518 prints (including 2,093 maps and diagrams, 21,010 photographs for illustrations and records, and 415 bromide enlargements), 4,674 zinc plates, 400 intaglio etchings, and 11 celluloid prints and mounted 5,165 prints.

LIBRARY

The library served nearly 10,000 readers during the year, about half of them not members of the Geological Survey. The total number of books, pamphlets, and serial parts circulated amounted to more than 46,000 items. Books borrowed from other libraries for the use of the Geological Survey numbered 1,249, and 1,310 books were loaned to other libraries. Loans to members of the Survey and to other individuals privileged to borrow books increased from 7,299 to 8,537. Nearly 19,000 new books, pamphlets, and serial parts and more than 1,500 maps and charts were received during the year, and more than 10,000 new cards were filed in the catalog.

The most satisfactory feature of the year was the authorization for binding of 1,784 volumes at a cost of approximately \$7,000, but the library's urgent needs for binding remain at 17,000 volumes, as of the accessions during the last 2 years many paper-covered volumes are in immediate need of binding.

The bibliography of North American geology for 1935-36 was delivered to the editor in April and is in press as Bulletin 892. The volume contains 4,716 entries, as compared to 3,836 entries in the volume for 1933-34.

During the year some 1,600 Geological Survey reports were transferred from the library to the division of distribution.

APPROPRIATIONS AND EXPENDITURES

The appropriation made directly for the work of the Geological Survey for the fiscal year 1937 included 10 items, amounting to \$2,807,817, of which \$76,804.88 remained unobligated on June 30, 1937. In addition, \$5,000 was allotted from appropriations for the Interior Department for miscellaneous supplies.

Classifications of Obligations Incurred by the United States Geological Survey During the Fiscal Year Ended June 30, 1937

	Salaries	Topo- graphic surveys	Geologic surveys	Alaskan mineral resources	Gaging streams
Salaries of permanent employees.....	\$140,385.69	\$591,058.35	\$421,393.25	\$41,405.87	\$848,714.56
Wages of temporary employees.....		561,957.06	25,796.99	3,800.91	212,918.69
Supplies and materials.....		13,258.64	6,515.84	629.91	36,107.14
Dead storage of passenger-carrying vehicles.....		21.31			19.59
Other storage and pasturage of animals.....		966.15	322.78		175.94
Communication services.....		1,275.29	339.20	5.56	5,143.60
Travel expenses.....		114,400.23	29,460.78	10,660.38	112,945.93
Hire, maintenance, repair, and operation of passenger-carrying vehicles.....		1,182.08	2,045.67		10,521.96
Transportation of things.....		5,025.27	2,042.60	357.80	8,903.35
Hire, maintenance, repair, and operation of freight-carrying vehicles.....		53,337.07	6,840.50		33,080.11
Printing and binding.....		136,352.61	4,451.81	85.99	4,897.80
Furnishing of heat, light, power, water, and electricity.....					174.90
Rents.....		39.41	221.13	600.00	3,037.16
Repairs and alterations.....		7,073.36	3,962.12	156.96	35,488.48
Special and miscellaneous current expenses.....		78.95	72.70		30.00
Purchase of passenger-carrying vehicles.....		1,065.93	2,407.80		11,784.77
Purchase of freight-carrying vehicles.....		1,135.02	4,842.03		13,905.55
Purchase of scientific instruments and parts.....		70,109.38	5,006.75		40,604.72
Other equipment.....		14,600.34	3,985.34	1,993.48	34,523.22
Structures and parts.....					21,221.93
Miscellaneous refunds, adjustments and transfers.....		104,796.54	463.99	25.00	156,544.29
Total.....	140,385.69	1,677,733.89	520,171.28	59,721.86	1,590,743.69

**Classifications of Obligations Incurred by the United States Geological Survey During
the Fiscal Year Ended June 30, 1937—Continued**

	Classifi- cation of lands	Printing and bind- ing	Prepara- tion of illustra- tions	Geologic and topo- graphic maps	Mineral leasing	Total
Salaries of permanent employees	\$83,284.20	-----	\$21,105.10	\$240,780.92	\$332,646.52	\$2,720,774.46
Wages of temporary employees	2,379.95	-----	-----	68.53	55,533.38	862,455.51
Supplies and materials	1,070.42	-----	256.24	59,808.80	3,491.24	121,137.73
Dead storage of passenger-carry- ing vehicles	-----	-----	-----	-----	55.00	95.90
Other storage and pasturage of animals	132.80	-----	-----	-----	22.00	1,619.67
Communication services	122.03	-----	-----	15.31	2,708.72	9,609.71
Travel expenses	6,402.61	-----	-----	105.22	22,839.65	296,814.80
Hire, maintenance, repair, and operation of passenger-carrying vehicles	1,158.94	-----	-----	-----	12,147.29	27,056.84
Transportation of things	187.25	-----	-----	480.79	2,825.25	19,822.31
Hire, maintenance, repair, and operation of freight-carrying vehicles	871.49	-----	-----	-----	1,750.56	95,879.73
Printing and binding	657.32	\$117,000.00	127.99	-----	743.51	264,317.03
Furnishing of heat, light, power, water, and electricity	-----	-----	-----	-----	3,972.35	4,147.25
Rents	-----	-----	-----	-----	1,173.65	5,071.35
Repairs and alterations	193.43	-----	-----	10,182.89	20,049.89	77,077.13
Special and miscellaneous current expenses	-----	-----	-----	-----	89.31	270.96
Purchase of passenger-carrying vehicles	610.03	-----	-----	-----	11,730.56	27,599.09
Purchase of freight-carrying ve- hicles	-----	-----	-----	-----	-----	19,882.60
Purchase of scientific instruments and parts	695.15	-----	-----	16.88	516.89	116,949.77
Other equipment	1,688.91	-----	-----	13,774.52	20,039.42	90,605.23
Structures and parts	-----	-----	-----	-----	-----	21,221.93
Miscellaneous refunds, adjust- ments and transfers	150.94	-----	-----	918.13	555.00	263,453.89
Total	99,605.47	117,000.00	21,489.33	326,121.49	492,890.19	5,045,862.89

In addition to the above amounts, there was expended directly by cooperating agencies \$64,151.82 for topographic surveys and \$403,570.02 for stream gaging.

APPENDIX

Topographic and planimetric mapping by the Geological Survey in the United States, Puerto Rico, and Hawaii, to June 30, 1937

State	Total area mapped during fiscal year 1937 (square miles)										Percent- age of total area mapped to June 30, 1937 (square miles)	Percent- age of total area of State mapped to June 30, 1937	Control, fiscal year 1937			
	For engraved publication with contour intervals from 5 to 100 feet on scale of 1 to—												Spirit levels (miles)	Transit traverse (miles)	Trian- gulation stations occupied	
	Planimetric ¹ on scale of 1 to—	24,000	31,680	12,000	15,840	24,000	25,000	30,000	31,680	62,500						125,000
Alabama.....					\$ 86				442		21,983	42.3	70	135	44	
Arizona.....									428		60,919	53.4	505	4		
Arkansas.....											23,760	44.6	178	222		
California.....					68				1,062	214	134,507	85.0	240		13	
Colorado.....	49	\$ 101			\$ 18			160	64		57,120	55.0	99		22	
Connecticut.....											4,965	100.0				
Delaware.....											2,370	100.0				
District of Columbia.....											70	100.0				
Florida.....									229		6,373	10.9				
Georgia.....					33				226		25,202	42.5	215	5	31	
Idaho.....					\$ 12				538	44	35,643	42.5	213		29	
Illinois.....									448		40,365	71.2	551	48		
Indiana.....											4,287	11.8	114	150		
Iowa.....											13,710	24.4	17	75		
Kansas.....											64,446	78.4				
Kentucky.....											27,358	67.4		50		
Louisiana.....	928										11,330	23.4	6 552	6 1,875		
Maine.....									14		21,876	66.2				
Maryland.....											12,327	100.0		143		
Massachusetts.....								704			8,266	100.0				
Michigan.....								61		61	14,894	25.7	315			
Minnesota.....	2,054										8,890	10.5	12	60		
Mississippi.....									253		7,511	115	96			
Missouri.....								88	2,377	805	52,579	75.7	6 9,934	6 9,247	11	
Montana.....											45,942	31.3	242			
Nebraska.....					4						27,931	36.0	118	676		
Nevada.....									267		54,991	49.7	307		26	
New Hampshire.....									201		9,302	100.0	89			
New Jersey.....											8,224	100.0				
New Mexico.....								49	48	89	45,069	36.8	102		12	
New York.....								21	293		49,204	100.0	84			
North Carolina.....	295				7 127				44		19,040	36.3	256	28	18	

North Dakota.....	152	152	14,534	20.5	60
Ohio.....	245	245	41,040	100.0	62
Oklahoma.....	49	49	42,172	60.2	112
Oregon.....	516	130	39,125	40.5	29
Pennsylvania.....	311	311	40,162	88.0	29
Rhode Island.....	5	187	1,248	100.0	6
South Carolina.....	372	372	15,278	49.3	3,244
South Dakota.....	160	160	19,887	25.6	31
Tennessee.....	7,182	7,182	23,633	56.2	16
Texas.....	41	41	90,295	34.0	290
Utah.....	13	13	20,955	24.7	55
Vermont.....	402	402	8,752	91.5	127
Virginia.....	375	375	37,897	88.9	499
Washington.....	20	20	41,532	60.1	248
West Virginia.....	54	54	24,170	100.0	148
Wisconsin.....	124	124	19,808	35.3	6
Wyoming.....	1,083	1,083	34,081	34.8	27
Total.....	1,749	1,749	1,435,023	47.4	17,298
Hawaii.....	19	19	6,435	100.0	5
Puerto Rico.....	526	526	271	7.9	5

¹ Prepared from aerial photographs with field examination and showing culture, drainage, and woodland, but no contours. Reproduction by 3-color photolithography (advance sheet).

² Revision mostly of culture only.

³ Resurveys in large part cover areas previously surveyed on a smaller scale.

⁴ New surveys cover areas not heretofore mapped.

⁵ Reproduction by 2-color photolithography (advance sheet).

⁶ Includes surveys administered and supervised by the Geological Survey and executed by emergency relief personnel but not previously reported.

⁷ Reproduction by 3-color photolithography (advance sheet).

⁸ Contour interval 5 meters.

Summary of Outstanding Mineral Withdrawals and Classifications

June 30, 1937, in acres

State	Coal		Oil		Oil shale		Phosphate		Potash
	With-drawn	Classified as coal land	With-drawn	Classified as oil land	With-drawn	Classified as oil-shale land	With-drawn	Classified as phosphate land	With-drawn
Alaska.....		56,993							
Arizona.....	139,415								
Arkansas.....		61,160							
California.....	17,603	8,720	1,178,392						90,324
Colorado.....	4,142,233	3,082,272	215,370		1,172,778	952,239			
Florida.....							66,796	120	
Idaho.....	11,520	4,603					276,239	270,036	
Louisiana.....			466,990	4,233					
Montana.....	6,259,193	19,373,884	1,336,697	67,651			280,089	3,833	
Nevada.....	83,673								39,422
New Mexico.....	4,119,616	984,829							9,282,160
North Dakota.....	5,954,364	11,178,286	84,894						
Oregon.....	4,361	18,887							
South Dakota.....		250,093							
Utah.....	3,404,043	1,267,697	1,344,473		2,737,274	2,703,755	277,344	2,937	
Washington.....	691,801	141,444							
Wyoming.....	2,143,991	6,847,235	541,777		2,079,897	425,214	989,133	25,293	
Total.....	26,971,813	33,276,103	5,168,593	71,834	5,989,949	4,081,208	1,889,601	302,219	9,411,906

¹ Includes 3,151 acres of coal land reserved for use of the United States (coal reserve no. 1).² Includes 13,578 acres withdrawn as helium reserve.³ Includes 2,078 acres of coal land reserved for use of the United States (coal reserve no. 2).

General Summary of Cases Involving Land Classification

Class of cases	Record for fiscal year 1936-37						Record since receipt of first case	
	Pending prior to July 1, 1936	Received during fiscal year	Total	Acted on during fiscal year	Pending June 30, 1937	Gain or loss during fiscal year	Received	Acted on
Mineral leasing laws:								
Permit applications.....	9	302	311	294	17	-8	62,353	62,336
Lease applications.....	209	1,837	2,046	1,635	411	-202	4,318	3,907
Committee cases.....	13	289	302	290	12	+1	13,157	13,145
Concurrence.....	21	1,537	1,558	1,494	64	-43		
Interference (surface rights).....	10	90	100	90	10			
Unit operation plans.....	595	547	1,142	981	161	+434	1,343	1,182
Cases involved in unit plans.....	2,528	783	3,311	2,345	966	+1,562	4,042	3,076
Development (drilling operations, etc.).....	5	56	61	59	2	+3	17,579	17,577
Mineral classification:								
Oil and gas (including "349").....	130	1,402	1,532	1,268	264	-134	29,943	29,679
Water and power:								
Federal Power Commission:								
Preliminary permits.....	5	48	53	41	12	-7	446	434
Determinations under sec. 24.....	19	36	55	52	3	+16	628	625
Classification.....	1	6	7	4	3	-2	557	554
Rights-of-way.....	15	138	153	123	30	-15	7,326	7,296
Irrigation project reports.....	2		2	2		+2	944	944
General information:								
General Land Office (coops., etc.).....	9	376	385	358	27	-18		
Indian Office.....							9,549	9,549
Total.....	3,571	7,447	11,018	9,036	1,982	+1,589		

¹ Includes all cases pending at beginning of fiscal year.

Mineral Production from Public Lands and Revenues accrued therefrom, Fiscal Year 1937

State	Petro- leum (barrels)	Natural gas (M cubic feet)	Gasoline (gallons)	Coal (short tons)	Potas- sium (short tons)	Sodium (short tons)	Phos- phate (short tons)	Accrued revenues
Alaska.....				134,115				\$7,181.55
Alabama.....				70,326				7,032.64
California.....	18,773,946	39,758,420	68,320,426	73		68,439		3,468,274.98
Colorado.....	1,156,234	2,679,558	88,858	597,299		1,499		162,905.43
Idaho.....				1,136			23,359	2,557.95
Louisiana.....	204,630	1,457,774	17,706					64,950.70
Montana.....	473,719	2,391,952		359,698			2,745	105,657.39
Nevada.....								160.00
New Mexico.....	5,632,723	16,397,193	1,059,270	46,012	449,584	5,932		652,676.03
North Dakota.....				477,472				29,656.85
Oklahoma.....	121,769		262,395					20,516.90
Oregon.....				27				206.75
South Dakota.....				2,832				508.84
Utah.....	611	107,794	11,856	1,329,040				133,999.44
Washington.....				27,788				2,778.86
Wyoming.....	10,488,279	15,652,570	27,961,659	1,175,385				1,601,671.80
Total.....	36,877,412	78,445,261	97,722,170	4,221,203	449,584	75,870	26,104	6,260,277.27
Total 1936.....	34,371,038	75,016,349	95,291,995	4,062,189	378,601	57,610	50,732	5,172,768.84

Figures for oil, gas, and gasoline from Louisiana, New Mexico, and Oklahoma are for 11 months ended May 31, 1937.

PETROLEUM CONSERVATION DIVISION

George W. Holland, *Director*

THE act approved by the President on February 22, 1935 (49 Stat. 30), regulating interstate and foreign commerce in petroleum and its products by prohibiting the shipment in such commerce of petroleum and its products produced in violation of State law, generally known as the Connally Act, was to have expired June 16, 1937, but by the act of Congress approved by the President, June 14, 1937 (Public No. 145, 75th Cong., 1st sess.), the act was extended to June 30, 1939.

By Executive Order No. 6979, dated February 28, 1935, the Secretary of the Interior was designated by the President to execute certain powers and functions vested in the President by the law, and subsequently Executive Orders Nos. 6980-B, 6980-C of March 1, 1935, Executive Order No. 7024-B of April 25, 1935, and Executive Order No. 7129-A of August 6, 1935, were issued for the enforcement of the law.

The Secretary of the Interior by Orders Nos. 1054 and 1057, dated March 14 and March 31, 1936, established the Petroleum Conservation Division to advise and assist him in the enforcement of the act and in the administration of Federal Tender Board No. 1 and Federal Petroleum Agency No. 1, both located at Kilgore, Tex. The Division is also authorized to discuss the work of any agency dealing with oil and gas, recommend action on any case brought to its attention, co-ordinate information, and, through appropriate channels, act as the contact agency with the Interstate Oil Compact Commission (see H. J. Res. 407, approved Aug. 27, 1935, Public Res. No. 64, 74th Cong., and S. J. Res. 183, approved Aug. 10, 1937, Public Res. No. 57, 75th Cong.), present required data to the Congress, attend oil and gas conferences in which the Department is interested, cooperate with the oil-producing States in the study of physical waste and the enactment of uniform oil and gas conservation laws, and contact other departments of the Government whose work deals in any measure with oil and gas.

Federal Tender Board No. 1 was established by Executive Order No. 6980-C on March 1, 1935, to operate in a designated area known as the East Texas Field, which includes the counties of Gregg, Upshur, Smith, Rusk, and a part of Cherokee. The Board is required to issue certificates of clearance, or tenders, permitting the shipment in interstate commerce of petroleum and its products whenever it determines that the petroleum or petroleum products does not constitute contraband oil. Contraband oil is defined as petroleum which, or any constituent part of which, was produced, transported, or withdrawn from storage in excess of the amounts permitted to be produced, transported, or withdrawn from storage under the laws of a State or any regulation or order prescribed thereunder by any board, commission, officer, or other duly authorized agency of such State, or any of the products of such petroleum.

Federal Petroleum Agency No. 1 was established by Executive Order No. 7024-B, dated April 25, 1935, to exercise all duties and functions pertaining or incidental to investigations necessary to the enforcement of the Connally Act and to investigate and report on all applications for tenders.

The administration of the act is essentially a field activity. Of the 72 persons employed at the close of the fiscal year, 58 were in the field and 14 in Washington.

It has been necessary to establish but one tender board, that in east Texas. Should the need arise, additional boards can be established by the President. The law is effective, however, in other fields, although the tender system is not employed.

The Rodessa Field in Louisiana, Texas, and Arkansas, was under constant observation, and examinations were made in other areas, such as Corpus Christi, Conroe, and Talco. Reports covering operations in Oklahoma, New Mexico, and Kansas were received and checked periodically.

THE EAST TEXAS FIELD

The need for a tender board in the East Texas Field is evident when the magnitude of the area is understood. This field is about 50 miles long and 3.5 to 10 miles wide. It contains more than 130,000 acres of productive territory in which 23,000 oil wells were producing in June 1937. Two-thirds of the flowing oil wells in the State of Texas are in this area. The field produces about 15 percent of the national crude oil output or nearly as much as the aggregate production from all of the wells in Louisiana, Kansas, and New Mexico, the three States which rank fourth, fifth, and sixth in national output. At the time the field was discovered in 1930, it contained at least one-fourth of the oil reserves of the entire United States. During the fiscal year, the reported production of crude oil in east Texas was 160,717,784 barrels,

of which 148,167,000 barrels, or 92 percent was shipped from the field on Federal tenders. Although only 8 percent of the crude oil is refined in the field, the petroleum products, including casinghead gasoline and butane, moving on Federal tenders totaled 23,230,000 barrels during the year. For summary of refineries operating in the East Texas field, see tables A and A-1 and for summary of casinghead operations see table B.

The Federal Government and the State of Texas have worked together in east Texas in the prevention of waste with the result that the ultimate productive capacity of the field has been greatly extended. It has been estimated that the recoverable oil from the field has been increased about 30 percent or 600,000,000 barrels, which would be equal to the discovery of 60 average size oil fields.

With the Federal Government prohibiting the shipment of contraband oil in interstate commerce and the State government disapproving its movement intrastate, the market for contraband oil is practically destroyed and the production of such oil in east Texas has been reduced to a fraction of 1 percent.

During the fiscal year, the Federal Tender Board and the Federal Petroleum Agency received and considered a total of 6,420 applications for tenders, of which 4,120 were for 227,104,844 barrels of crude petroleum, and 2,300 for 23,187,091 barrels refined products. All of the applications were approved by the Board except 65 for crude petroleum and 28 for refined products.

Tenders were issued for 223,742,735 barrels of crude petroleum. Applications not approved totaled 2,670,463 barrels and applications pending totaled 974,964 barrels. For refined products, tenders were issued for 23,230,065 barrels. Applications for refined products not approved totaled 33,650 barrels and applications pending totaled 176,474 barrels.

Of the total production allowable of 163,245,068 barrels for the East Texas Field during the fiscal year, 99.15 percent was represented by wells reported to the Tender Board.

Almost all of the crude oil shipped from the East Texas Field on Federal tenders moved through 12 trunk pipe lines and various gathering systems. For details of this operation see tables C and C-1.

The principal activities of Federal Petroleum Agency No. 1 have been in the east Texas area.

Throughout the fiscal year continuous efforts were made by the Agency to detect violations and to prepare and present cases to the Department of Justice. As of June 30, 1936, 84 investigations were

pending and during the fiscal year, 124 new investigative cases were set up by the Agency and assigned to members of the staff. At the close of the year, 66 cases were pending. A total of 31 cases were referred to the Department of Justice.

The marine unit at Houston, Tex., was discontinued during the fiscal year. During the fiscal year examiners were assigned to the Rodessa, Corpus Christi, and Houston areas, and investigations were made and reports prepared under the Connally Act in certain fields of southern Louisiana and west Texas. In the East Texas Field a check was made of a large number of leases to determine whether such leases could make their full allowable in accordance with the rules and regulations of the Railroad Commission of Texas.

The following table shows the expenditures made of available funds:

Personal Services	
<i>Agency</i>	<i>Appropriation</i>
Petroleum Conservation Division.....	\$50, 900
Federal Tender Board No. 1 and Federal Petroleum Agency No. 1.....	151, 875
Total	202, 775

Miscellaneous	
<i>Class</i>	<i>Appropriation</i>
Materials and supplies.....	\$13, 866
Communications.....	2, 123
Travel.....	6, 695
Transportation of things.....	351
Printing and binding.....	1, 192
Rent of buildings.....	11, 017
Equipment.....	1, 675
Total	36, 919
Total obligated	239, 694
Unobligated	60, 306
Total funds available	300, 000

	<i>Washington</i>	<i>Field</i>	<i>Total</i>
Personnel as of June 30, 1936:			
Petroleum Conservation Division (including Federal Tender Board No. 1 and Federal Petroleum Agency No. 1).....	19	78	97
Personnel as of June 30, 1937:			
Petroleum Conservation Division (including Federal Tender Board No. 1 and Federal Petroleum Agency No. 1).....	14	58	72

SUMMARY OF OPERATIONS

Refineries Operating in the East Texas Field and Reporting to the Federal Tender Board
No. 1, Fiscal Year Ending June 30, 1937

CRUDE PETROLEUM

	Barrels
Stocks 7 a. m., beginning of period.....	303, 676
Receipts:	
East Texas crude via pipe line.....	11, 460, 648
East Texas crude via trucks.....	10, 940
East Texas crude from casinghead plants.....	383
Rodessa crude via pipe line.....	688, 639
Talco crude via pipe line.....	16, 020
Talco crude via tank car.....	147, 221
Southwest Texas crude via tank car.....	162, 159
Total crude to be accounted for.....	12, 789, 686
Disposition:	Percent
East Texas crude charged to stills.....	92. 01.. 11, 395, 634
Rodessa crude charged to stills.....	5. 34.. 660, 989
Talco crude charged to stills.....	1. 37.. 169, 516
Southwest Texas crude charged to stills.....	1. 28.. 158, 202
Total crude distilled.....	100. 00.. 12, 384, 341
East Texas crude burned at refineries.....	183
East Texas crude transferred to fuel oil.....	132
East Texas crude delivered to pipe lines.....	37, 274
Adjustments in crude stocks.....	1, 138
Crude sold or otherwise disposed of.....	2, 207
Stocks 7 a. m., close of period.....	280, 874
	12, 706, 149
Net difference in stocks during period.....	83, 537
Total crude accounted for.....	12, 789, 686

TABLE A-1

Refineries Operating in the East Texas Field and Reporting to the Federal Tender Board
No. 1, Fiscal Year Ending June 30, 1937REFINED PRODUCTS—STOCKS, DELIVERIES, AND YIELDS¹

Product	Stocks 7 a. m., end of period	Deliveries	Stocks 7 a. m., beginning of period	Casinghead gasoline blended and other products received	Add ²	Manufac- tured	Per- cent yield
Fuel oil.....	50, 107	2, 529, 552	48, 004	132	24, 931	2, 556, 454	20. 643
Gasoline and naphtha.....	116, 414	7, 632, 683	119, 768	232, 227	8, 752	7, 405, 854	59. 800
Kerosene.....	20, 986	615, 285	22 233	958	3, 031	616, 111	4. 975
Gas oil distillate.....	6, 095	675, 745	24, 985	-----	4, 665	661, 520	5. 341
Unfinished oils.....	39, 833	641, 487	119, 375	13, 271	14, 399	563, 073	4. 547
Loss in refining.....	-----	-----	-----	-----	-----	581, 329	4. 694
Total.....	233, 435	12, 094, 752	334, 365	246, 588	55, 778	12, 384, 341	100. 000

¹ All figures in barrels.² Stocks of refineries discontinuing operations or reports during fiscal year.

Summary of Casinghead Plant Operations in the East Texas Field, Fiscal Year Ending June 30, 1937

	Monthly average
Number of plants operating in the field.....	19
Number of plants reporting to the Federal Tender Board No. 1.....	17
Number of wells feeding 16 plants.....	18, 921
Allowable oil for above wells (barrels).....	11, 853, 166
	Fiscal year totals (million cubic feet)
Gas received from leases.....	47, 202, 161
Still gases received from refineries.....	425, 652
Total gas processed.....	47, 627, 813
Stocks beginning of period:	Barrels Barrels
Casinghead gasoline.....	29, 975
Straight run gasoline.....	1, 324
Naphtha.....	1, 654
Total stocks beginning of period.....	32, 953
Casinghead gasoline, butane, and propane manufactured from lease gas.....	¹ 4, 387, 209
Gasoline manufactured from still gases.....	56, 692
Total manufactured.....	4, 443, 901
Casinghead gasoline received at plants.....	6, 696
Naphtha and straight run gasoline received for further processing.....	154, 255
Total supply.....	4, 637, 805
Shipments of casinghead gasoline intrastate.....	2, 770, 311
Shipments of casinghead gasoline interstate.....	1, 765, 026
Total shipments.....	² 4, 535, 337
Evaporation and handling loss.....	42, 151
Casinghead and butanes vented and flared.....	34, 734
Stocks 7 a. m. end of period:	
Casinghead gasoline.....	23, 386
Straight run gasoline.....	1, 192
Naphtha.....	1, 005
Total stocks end of period.....	25, 583
Total disposition.....	4, 637, 805
Average monthly allowable oil per well (barrels).....	626. 46
Average monthly gas production per well (million cubic feet).....	207. 88
Average gas-oil ratio of wells (cubic feet per barrel).....	331. 85
Average gallons casinghead gasoline, butane, and propane per million cubic feet well gas.....	3. 90
Average gallons gasoline per million cubic feet still gas.....	5. 59

¹ Includes 316,868 barrels butanes and 11,839 barrels propanes.

² Includes butanes and propanes.

Summary of Operations, 12 Trunk Pipe Lines and Various Gathering Systems Operating in the East Texas Field and Reporting to the Federal Tender Board No. 1, Fiscal Year Ending June 30, 1937

ACCOUNTABLE CRUDE PETROLEUM AND PRODUCTS

	<i>Barrels</i>	<i>Barrels</i>
Stocks 7 a. m. beginning of period:		
East Texas crude.....	3,688,479	
Rodessa crude.....	177,114	
Van crude.....		
Topped crude.....		
Gasoline.....		
Casinghead gasoline.....	1,760	
Total opening stocks.....		3,867,353
Receipts:		
East Texas crude run from leases of reporting producers.....	160,861,929	
East Texas crude run from leases of delinquent producers.....	111,879	
Total east Texas crude run from leases.....	160,973,808	
East Texas crude from gasoline and reclamation plants.....	94,753	
East Texas crude from nonreporting pipe lines in field.....	37,522	
East Texas weathered crude from broker.....	9,870	
East Texas crude from refineries.....	45,818	
Rodessa crude from Rodessa field.....	4,292,736	
Talco crude from Talco field.....	19,008	
Van crude from Van field.....	223,502	
Total crude receipts.....		165,697,017
Topped crude received from refineries.....	470,973	
Kerosene received from refineries.....	12,412	
Recycle stock received from refineries.....	2,594	
Gasoline received from refineries.....	69,713	
Casinghead gasoline from gasoline plants.....	3,168,824	
Total petroleum products received into lines.....		3,724,516
Net overage reported:		
East Texas crude.....	48,008	
Van crude.....	3,028	
Gasoline.....	17	
Total net overage reported.....		51,053
Total receipts and opening stocks.....		173,339,939
Less net corrections in various monthly opening stocks.....		19,105
Net crude and products to be accounted for.....		173,320,834
Interline receipts.....		70,911,345
Total of all oils handled.....		244,232,179

TABLE C-1

CRUDE PETROLEUM AND PRODUCTS ACCOUNTED FOR

Deliveries:	Barrels	Barrels
East Texas crude direct from field.....	148,167,139	
Rodessa crude direct from field.....	3,074,828	
Van crude direct from field.....	226,272	
Talco crude direct from field.....	2,988	
Topped crude direct from field.....	407,407	
Kerosene direct from field.....	13,736	
Gasoline direct from field.....	58,705	
Casinghead gasoline direct from field.....	3,149,140	
Total deliveries direct from field.....		155,100,215
East Texas crude to east Texas refineries reporting to Federal Tender Board No. 1.....	11,458,157	
Rodessa crude to east Texas refineries reporting to Federal Tender Board No. 1..	688,639	
Talco crude to east Texas refineries reporting to Federal Tender Board No. 1..	16,020	
Total crude to east Texas refineries reporting to Federal Tender Board No. 1..	12,162,816	
East Texas crude to east Texas refineries not reporting to Federal Tender Board No. 1.....	916,973	
Topped crude to East Texas refineries not reporting to Federal Tender Board No. 1.....	116,163	
Total crude delivered to refineries.....		13,195,952
East Texas crude delivered to reclamation plants.....	627	
East Texas crude delivered to pipe lines not reporting to Federal Tender Board No. 1.....	20,173	
East Texas crude delivered to broker not reporting to Federal Tender Board No. 1.....	956	
East Texas crude consumed in Field.....	31,513	
Recycle stock delivered to east Texas refineries.....	2,594	
Net shortage reported:		
East Texas crude.....	9,545	
Rodessa crude.....	10,943	
Van crude.....	258	
Topped crude.....	1	
Casinghead gasoline.....	18,396	
Total net shortage.....		39,143
Stocks 7 a. m. close of period:		
East Texas crude.....	4,384,662	
Rodessa crude.....	523,764	
Van crude.....		
Topped crude.....	839	
Gasoline.....	11,025	
Casinghead gasoline.....	9,371	
Total closing stocks.....		4,929,661
Total crude and products accounted for.....		173,320,834
Interline deliveries.....		70,911,345
Total of all oils handled.....		244,232,179

OFFICE OF INDIAN AFFAIRS

John Collier, *Commissioner*

THE Federal Government, working through the Office of Indian Affairs, has had the traditional role of guardian of Indian property and protector of Indians. As conservator, the Indian Office has been at times faithless, and through most of later times ineffective. In recent years, protections for Indian property have been tightened, but it has not been until the past 3 years that the tide has been turned and that Indian property has begun to increase in amount and value.

Of the 130,000,000 acres held in trust for Indians by the Government in 1887, when the General Allotment Act was passed, some 49,000,000 of the poorest acres remained in 1933. At the close of the fiscal year 1937, this amount had been increased to approximately 52,650,000 acres, with additional purchases pending.

Land has not only been acquired for Indians, been safeguarded from slipping away: Indian land, through allocations of emergency funds, is being rebuilt. Only a beginning has been made, but already the healing of damaged Indian ranges, the protection of Indian timber and the blessing of new water supplies have helped to revitalize Indian land.

More important, even, than economic benefits from augmented resources have been the reorganization of Indian enterprise and the kindling of confidence among Indian groups in their undertakings of tribal enterprise.

This report, which tells something of the work of the past year, deals first with this progress in Indian reorganization, then with efforts to conserve and administer Indians' physical resources and to provide Indians with a source of livelihood, then with education of Indian children and the Indian health program. It concludes with a discussion of the steps being taken to improve the mechanics of the Indian Service, and with a brief mention of problems yet unsolved.

TRIBAL GOVERNMENT PROBLEMS

The problems which immediately confront newly organized tribes are several, but perhaps the most immediate and most pressing is that of getting funds on which to operate. Tribal funds, which are derived from a cash conversion of tribal capital assets or from income on tribal property, are deposited in the Treasury and cannot be appropriated to tribal use except by Congress or, in some instances, with the approval of the Secretary of the Interior. Therefore, even though tribes may have funds to their credit, under still-existing law they are in the position of incompetent wards with inheritances lying securely in the hands of a guardian. These tribes must find their own sources of revenue. If they are fortunate enough still to own unallotted tribal land, they may cause the rental on the land to be paid into their tribal treasury instead of into the Federal Treasury, as previous law required. Several tribes have already taken steps to bring about this change of procedure, and others will follow. This advantage, as has been pointed out, is accessible only to tribes owning undivided communal land.

As tribes become incorporated and borrow money from the act's revolving credit fund to establish and develop business or agricultural enterprises, other revenue will come in. Such revenue will also be under tribal rather than governmental control. Another means of securing revenue, the possibilities of which have scarcely been explored as yet, would be a system of fees for services which the tribal government renders its members and for privileges which it extends to nonmembers. This task of obtaining revenue to cover the costs of tribal government operations is critical, and in its solution will lie the future of successful group activity for many tribes.

The land tangle.—A problem scarcely less important is that of land utilization and management. It is most graphically illustrated in the case of heirship lands which have become so entangled in a welter of fractionate ownership that Indians and agency officials alike get to the point of throwing up their hands in despair. Meantime, the land lies idle or is leased, usually to non-Indians. Through the machinery for exchange of lands, which the Reorganization Act authorizes, an indication is given of how the problem might be solved. It could be solved far more quickly if money were available to purchase lands in such dolorous standing. It can be appreciated, however, how much money would be required when it is considered that approximately 7,000,000 acres are involved. At one reservation, Flathead in Montana, the Indians have taken the initiative in this matter by having a bill introduced in Congress which would permit them to use their own tribal funds for the purchase of lands within the reservation borders. This would allow them to purchase not only heirship lands but lands which have gone into white ownership.

Applied anthropology aids in administration.—The Indian Service continues to make use of applied anthropology in formulating its policies and in dealing with Indian groups. The small anthropological staff has continued to devote its efforts primarily to the gathering of social and economic facts regarding tribes or groups which are organizing either under the Indian Reorganization Act, the Oklahoma Indian Welfare Act, or the Alaska Act. The main concern has been to see that the constitutions are really based on the contemporary social and economic life of the people concerned. Unfortunately, the staff has been too small to gather basic facts for all tribes which are organizing.

During the current year the applied anthropology staff was reorganized from dollar-a-year positions to regular civil service status.

TRIBAL ORGANIZATION

At the end of the fiscal year, 65 tribes, representing an Indian population of 86,238, had adopted constitutions and by laws, to which formal approval had been given by the Secretary of the Interior. Of these tribes, 32 had ratified charters of incorporation, the population of this latter group being 34,492. Constitutions and charters for additional groups were in process of being drafted and considered, and will be voted upon in the course of the fiscal year 1938.

Oklahoma groups begin to organize.—The figures above are exclusive of the Oklahoma tribes, where organization work did not begin until a few months before the close of the fiscal year. There are approximately 38 tribal groups eligible for organization in Oklahoma. Some will probably not undertake formal reorganization. At present, two constitutions have been voted upon, in elections in which not a dissenting vote was cast. One charter has been ratified, in an election likewise unanimous.

What reorganization work in Oklahoma thus far has disclosed is the fact that interest in tribal survival has endured in spite of the almost complete destruction of tribal reservations and tribal governments. Particularly in eastern Oklahoma among the Five Civilized Tribes, the idea has been prevalent that tribal feeling had largely disappeared. Actually, among the Creeks and to lesser extent among the Cherokees, native patterns of community organization and group action have persisted.

Organization of Alaskan villages.—The problem of organizing the Alaska natives is complicated by several factors. First, by the great distances between villages, to which the lack of transportation and the enduring winter add immeasurably. Transportation is limited to boats for coast travel and to dog teams for interior travel—both of which are slow; and to airplane travel, which, while rapid, is expensive. Actually, the cost of transportation by boat or dog team, considering the amount of time, is about as expensive as air travel.

Organization work also is complicated in that the Alaska natives, with some exceptions, do not fall into well-defined tribal groups occupying definite geographical areas and having a tradition of tribal organization and a background of governmental recognition. Tribes in the United States, while they have been scattered and tribal governments have been broken down, at least have behind them a history of a common life upon Indian reservations. There is no such history in Alaska, and even the status of land ownership is an ambiguous one which in some cases may have to be clarified before organization work can proceed.

At the close of the year, nine constitutions had been submitted to Washington by village groups in Alaska, and these were being reviewed.

The Hopi organize.—Few anthropologists or students of Hopi life were ready to believe that the Hopi Indians in Arizona would ever agree to come together. There are nine independent villages at Hopi, speaking two unrelated languages (Hopi and Tewa), besides various dialects. There was practically no tradition of concerted tribal action. Added to this were important social differences, unlike interests, even rivalries, and extreme divergencies in the acceptance of white culture. These were the elements which had to be welded together into a working agreement of representative government. Also, the Hopi were inclined to suspect any suggestion of self-improvement emanating from Washington.

What seemed to be the impossible was accomplished. Approximately 50 percent of the eligible voters came to the polls in October 1936, and of the ballots cast 80 percent were in favor of the constitution. The preamble of the rather remarkable Hopi document speaks of it as "a way of working together for peace and agreement between the villages, and of preserving the good things of Hopi life, and to provide a way of organizing to deal with modern problems, with the United States Government and with the outside world generally."

MAKING CREDIT AVAILABLE

Credit has been an urgent Indian need. Until passage of the Reorganization Act, credit was obtainable only in meager amount from reimbursable funds, which reverted to the Treasury when repaid; and in some cases from tribal funds. The Reorganization Act authorized a revolving fund of \$10,000,000, of which \$2,500,000 was appropriated in 1936 and \$980,000 in 1937. Of the appropriated amounts, \$50,000 was authorized for administrative expenses in 1936 and \$65,000 in 1937.

LOANS TO INDIAN CORPORATIONS

Due to the fact that loans from the Reorganization Act fund may be made only to Indian chartered corporations, loans have had to be deferred until tribes organized and obtained charters of incorporation from the Secretary. Meantime, studies of credit needs were made, regulations formulated and the credit system explained. As tribes organized and formed plans, loans were made.

The following commitments were made during the 1937 fiscal year (of the total amount of \$2,719,931, the sum of \$410,908 had been advanced by June 30, 1937):

Reservation or Agency	Corporation	Amount
Blackfeet, Mont.....	The Blackfeet Tribe of the Blackfeet Reservation.....	\$100,000
Crow Creek, S. Dak.....	The Lower Brule Sioux Tribe.....	40,000
Carson, Nev.....	The Pyramid Lake Paiute Tribe.....	15,000
	The Fort McDermitt Paiute and Shoshone Tribe.....	20,000
Flathead, Mont.....	The Confederated Salish and Kootenai Tribes.....	65,000
Great Lakes, Wis.....	The Red Cliff Band of Lake Superior Chippewa Indians.....	16,000
Mescalero, N. Mex.....	The Apache Tribe of the Mescalero Reservation.....	163,000
Rocky Boy's, Mont.....	The Chippewa Cree Indians of the Rocky Boy's Reservation.....	55,000
Rosebud, S. Dak.....	The Rosebud Sioux Tribe.....	35,000
Salem School, Oreg.....	The Confederated Tribes of the Grand Ronde Community.....	3,000
Tulalip, Wash.....	The Tulalip Tribes of the Tulalip Reservation.....	15,000
	The Muckleshoot Tribe of the Muckleshoot Reservation.....	10,000
Tongue River, Mont.....	The Northern Cheyenne Tribe of the Tongue River Agency.....	¹ 2,090,931
Winnebago, Nebr.....	The Winnebago Tribe of Nebraska.....	35,000
	The Ponca Tribe of Native Americans of Nebraska.....	7,000
	The Santee Sioux Tribe of Nebraska.....	20,000
	The Omaha Tribe of Nebraska.....	30,000
Total commitments.....	.....	\$2,719,931

¹\$2,060,931 is for a series of loans covering a period of 18 years.

The loans are largely for industrial purposes. Each borrower from the corporation is required to work out a definite plan showing how he expects to use the funds, and the source from which repayment will be made. The time of the loans is determined by the type of enterprise in which the funds are invested. The maximum time for which a corporation may receive a loan is 20 years. The interest rate which corporations may charge has been set at 3 percent. The Government requires a 1 percent charge.

LOANS TO INDIANS OF OKLAHOMA

The Oklahoma Indian Welfare Act authorized the appropriation of \$2,000,000 for loans to Oklahoma Indians, associations, and corporate groups. In addition, it made available for loans to Oklahoma Indians a just share of funds appropriated pursuant to the Indian Reorganization Act. No appropriation was made under the Oklahoma Indian Welfare Act; consequently it has been necessary to conduct credit activities in Oklahoma from the funds and with the staff provided under the Indian Reorganization Act.

During the year a number of individual loans have been made, totaling \$19,521 under the Oklahoma credit system. Charters for

1 district and for 22 county credit associations in Oklahoma were approved. These organizations will borrow money from the Government, and will loan to Indians in the respective districts. One cooperative livestock association charter was approved on the Cheyenne and Arapaho jurisdiction.

REIMBURSABLE FUNDS USED FOR INDIAN ENTERPRISES, EDUCATIONAL LOANS, RELIEF

The act providing appropriations for the fiscal year 1937 carried \$165,000 for encouraging industry and self-support among Indians. All but \$404.51 of this sum was allotted to 33 jurisdictions. This was supplemented with allotments totaling \$363,387.62 from tribal loan funds.

Fifteen thousand dollars of the general appropriation was set aside for educational loans; \$14,187.31 was allotted to 17 jurisdictions for loans to 82 students. Sixteen students from nine tribes received loans totaling \$3,246 from their respective tribal loan funds.

Several sources of relief have been available during the year; consequently, it has not been necessary to use a large amount of reimbursable funds for subsistence. Only \$3,773 was used for support loans as against \$12,355 last year, all made from the general appropriation.

TRIBE REHOUSES ITS MEMBERS

The Mescalero Apaches have been living during the past 15 or 20 years around the central agency, in shacks and wickiups in appalling disrepair. The Indians leaned heavily for guidance and economic help upon the agency personnel. There is ample land (tribally owned and assigned to individuals) at Mescalero, but apathy has prevailed and assignments have never been put to their full use.

The tribe organized under the Indian Reorganization Act and ratified its charter on August 1, 1936. Subsequently, on its own initiative, the tribe has worked out, with Indian Service staff members, a plan to change its entire economic life—to rehouse its members on or near their land assignments, and to equip them to work their land. The tribe has borrowed \$163,000 from the revolving fund. Of this amount \$144,000 is being used to build 108 homes in 5 communities (there are about 750 Indians on the reservation). Work on the houses is being done under the supervision of the tribal business committee and the agency. If individuals do not make good use of the houses and lands assigned to them, the business committee has the power to remove them and reassign the houses and lands. Repayment to the loan fund will be made from proceeds from tribal timber sales.

Of the loan of \$163,000, approximately \$18,000 has been reloaned to individuals for purchase of farm equipment and teams. Fifty-four loans, averaging \$310 each, were made this spring. More than \$1,000

has been repaid already. Every family which obtained a loan planted a garden this year; they are now making arrangements to can the surplus produce.

LAND INCREASES IN AREA, PROTECTIONS ARE TIGHTENED

Indian landholdings have increased during the year. Sources of increase have been several: Through restoration (by authority of sec. 3 of the Indian Reorganization Act) of lands to reservation status which had been formerly opened to homestead entry; through the land purchase fund of the Indian Reorganization Act; through land purchase funds provided by the Resettlement Administration; and by various special acts.

LANDS RESTORED TO INDIANS THROUGH THE INDIAN REORGANIZATION ACT

Under section 3 of the Indian Reorganization Act, 349,207.73 acres, formerly opened to sale or entry, have been restored to tribal ownership and reservation status. The total restorations made to date are as follows:

Reservation:	<i>Acreage</i>
Utes (Ute Mountain Band), Colo.....	30, 000
Grand Portage, Minn.....	9, 277. 59
Flathead, Mont.....	192, 425. 63
Kiowa, Comanche, and Apache, Okla.....	¹ 600
Pine Ridge, S. Dak.....	9, 504. 51
Standing Rock, N. and S. Dak.....	107, 400
Total.....	349, 207. 73

¹ Approximate.

Under the provisions of section 2 of the amendment of May 1, 1936 (49 Stat. 1250), to the Indian Reorganization Act, relating to the Territory of Alaska, 300,000 acres were withdrawn for the benefit of natives of Eklutna. Additional withdrawals involving approximately 6,000,000 acres are in various stages of progress.

LAND ACQUIRED THROUGH REORGANIZATION ACT FUNDS

By authority of the Reorganization Act, Congress appropriated \$1,000,000 for the acquisition of land during the fiscal year 1936. For the fiscal year \$1,000,000 was again appropriated, and in addition the Secretary of the Interior was authorized to enter into contracts for the acquisition of additional land, not to exceed a total of \$1,000,000. With these funds and authority to contract, 236,783 acres were optioned and 105,965 were purchased.

Furthering the land acquisition program under the Reorganization Act, \$950,000 has been appropriated to meet the contracts entered into by the Secretary of the Interior under the 1937 contractual

authority referred to above; in addition \$500,000 has been appropriated with which to make new acquisitions during the fiscal year 1938.

The lands being acquired for Indians under the provisions of the Reorganization Act are classified as irrigable, agricultural, grazing or forest in character. They are being utilized to establish or complete tribal agricultural, grazing and forestry units and for use by individuals as small farms, subsistence gardening tracts and home sites; also as fishing sites and wild rice camps. Some timber and grazing lands are being acquired; however, where it is known that lands are to be acquired for farming or subsistence gardening purposes for individuals, only desirable agricultural lands are selected, since one of the outstanding objectives of the purchase program is to buy lands upon which Indians can make a living.

In those cases where purchases are being made for tribal and community purposes the lands will remain in large compact areas, to be administered by the Indians themselves for the benefit of the tribe. Where purchases are being made for individual family use the lands will be available for their use through assignments issued by the tribal council.

When purchases are completed, other units of the Service, particularly the extension, credit, and organization groups, step into line to advise and help on problems of home building and acquisition of stock and equipment.

RESETTLEMENT PURCHASES ADD TO INDIAN LANDS

The Resettlement Administration, which took over the submarginal land program of the Federal Emergency Relief Administration, has accepted options constituting legal commitments covering 1,218,395 acres of land within or adjacent to existing Indian reservations or communities, at a total option price of \$3,585,165. Of this area the purchase of 993,673 acres, at a cost of \$2,655,145, has actually been completed.

SPECIAL PURCHASES ADD VARIOUS SMALLER TRACTS

The purchase of lands under the Arizona Navajo Boundary Extension Act of June 14, 1934 (48 Stat. L., 960), was brought nearer to completion by the purchase of 13,757.62 acres, together with improvements, at a cost of \$41,478.82. This brings the total purchases under this act to 323,903.99 acres.

Under acts of Congress 12.19 acres have been added to the Barona Ranch, Calif. (Capitan Grande Indians); 240 acres have been added to the Kanosh Reservation, Utah; 320 acres have been added to the Koosharem Reservation, Utah; 1,280 acres have been added to the Shivwitz Reservation, Utah; and authority has been granted for the purchase of 640 acres for the Santa Rosa band of Mission Indians, California.

Legislation has also been enacted authorizing the exchange of Indian lands in Owens Valley, Calif., for lands and water rights now owned by the city of Los Angeles. This legislation enables the city of Los Angeles to acquire lands needed for watershed purposes and provides lands for the Indians better than those they now own.

The progress reported last year in the purchase of land within the various Pueblos in New Mexico with funds awarded pursuant to the Pueblo Lands Board Act as amended continued during the fiscal year 1937. Purchases of 64 tracts totaling 3,201.43 acres were completed, involving an expenditure of \$77,368.97. Negotiations are now under way for the purchase of many more tracts.

Lands have been acquired through purchase and donation for school, hospital, and other administrative purposes, involving six tracts covering 295.44 acres. The total cost of the lands was \$1,962.

NEW MEXICO NAVAJO BOUNDARY BILL STILL PENDING; LAND LEASED FOR NAVAJOS

During the year an aggregate of 497,722.75 acres of white-owned land was leased for the Navajo Indians at an annual rental of \$16,275.01. The lands were leased pending acquisition by purchase or exchange in Arizona under the provisions of the act of June 14 (48 Stat. L., 960), and the enactment of similar legislation applicable to New Mexico.

TRUST PERIODS EXTENDED

Trust periods were extended automatically, by authority of the Indian Reorganization Act, for all tribes which accepted the act. As a protection to those tribes which did not accept the act, by order of the President dated September 30, 1936, the period of trust on allotments made to Indians and on lands patented to tribes or bands of Indians which otherwise would have expired during the calendar year 1937 was extended for a further period of 25 years.

CANCELLATION OF FORCED PATENTS AND RECOVERY OF TAXES

During the past fiscal year 2,454.72 acres of land were restored to their original trust status through cancellation of 15 patents in fee issued to various Indian allottees during the trust period without their application or consent. Cancellation of the patents was effected under the authority of the act of February 26, 1927 (44 Stats., 1247), as amended and supplemented by the act of February 21, 1931 (46 Stats., 1205). The total number of such cancellations of which the Indian Office has record is 469.

Judgments in suits instituted by the Department of Justice at the request of the Indian Office were rendered by various Federal courts for the recovery of taxes illegally collected or to cancel tax assessments involving approximately 75 allotments for which patents in fee were

issued without application and heretofore canceled by the Department under the authority of the acts above cited. Recommendations were made to the Department of Justice for the institution of similar suits involving approximately 30 additional allotments and the cases are now pending.

A FEW SALES AND PATENTS IN FEE MADE TO AVOID HARDSHIP IN INDIVIDUAL CASES

A few tracts have been sold to meet emergency situations on reservations not affected by the provisions of the Indian Reorganization Act and these mostly have been tracts located in areas not predominately Indian-owned. A number of Indians have conveyed their lands, or portions of them, to the United States in trust for other Indians and many inherited allotments have been partitioned so as to give each heir a separate tract of land for his individual use and occupancy. Adjustments of this nature are constantly being made.

Permits and leases for business purposes have increased since sales of trust allotments have been precluded; these bring additional income to the Indians. Tribal councils and business committees have the authority to determine, subject to departmental approval, the tribal lands to be used for mission and church purposes.

Restricted lands of individual members of the Five Civilized Tribes, totaling 2,711 acres, were sold. Of this, 980 acres were to be used for State and Federal projects and the majority of the remaining sales were restricted to emergency situations or where the lands were taxable and were about to be lost through tax sales.

Only eight patents in fee for trust allotments were issued to Indians upon application. In all of these instances it was shown that such action was necessary in order to relieve conditions of financial distress, and that the sale of such lands would not interfere with the program of consolidating lands in Indian ownership. The restrictions were removed from four tracts of purchased land under similar circumstances, and for the most part involved town property.

To protect the lands of Five Civilized Tribes Indians in Oklahoma approximately 48 suits have been instituted upon the recommendation of this office to remove clouds from the title and recover possession of allotted or purchased lands. Such of these cases as have been brought to a conclusion have been almost invariably decided in favor of the Indians.

The act of June 20, 1936 (49 Stats., 1542), which declared that all lands theretofore purchased out of trust or restricted funds of an Indian and conveyed by a deed restricting alienation or encumbrance of the land without the consent of the Secretary, should be exempt from taxation until otherwise directed by Congress was amended by the act of May 19, 1937 (Public, No. 96, 75th Cong. 1st sess.), so as to limit its effect to homesteads to be selected by the Indian owner of the land.

INDIAN MINERALS ADMINISTERED ON CONSERVATIVE BASIS

On September 4, 1936, the Department transferred full supervision of field operations, including royalty accounting, of oil and gas leases under the jurisdiction of the Five Civilized Tribes Agency to the district engineer, Geological Survey, Tulsa, Okla. This work has been done by the Survey engineers for some time prior to September 4 at other agencies in Oklahoma outside of the Osage Reservation. New oil and gas operating regulations were approved, following the transfer, on October 30, 1936.

There has been considerable increase in interest in oil and gas lease sales in Oklahoma, particularly in the area of the Choctaw and Chickasaw Tribes and on the Kiowa Reservation. There was a slight increase in the production of oil on the Osage Reservation during the year. Developments continued on the Blackfeet Reservation in Montana. There was practically no activity in oil and gas leases on the Crow Reservation, although there are a few producing wells on that reservation. Two placer gold mining leases have been approved in the Big Horn Canyon of the Crow Reservation. Developments so far have indicated fair prospects of the recovery of some royalty from these leases, but sufficient work has not been accomplished to show definite value of the leases.

There has been considerable increase in activity on leases of restricted Quapaw Indian lands for lead and zinc mining purposes due to the increased price for concentrates during the year.

INDIAN FOREST AND RANGE RESOURCES

A large share of the remaining Indian estate is in the form of range, timber, and wildlife. These assets are administered through the superintendents by the Division of Forestry and Grazing, which, during recent years, has shaped its policies to insure enjoyment and return from these resources for all time.

To put into effect these principles of conservation, the General Grazing Regulations of December 28, 1935, the General Forest Regulations of April 23, 1936, and the Navajo and Hopi Grazing Regulations of June 2, 1937, were approved and promulgated by the Department, and major forward steps have been taken in giving them practical expression.

CONSERVATION POLICY STRENGTHENED

The year past has been one of action in the promotion of the principles of conservation on Indian lands. Range studies have been conducted to establish carrying capacities which will maintain the productivity of the land in perpetuity. Timber surveys have been carried out which when completed will make possible the compilation of careful working plans for the major forested reservations and insure the practice of sustained yield forest management. A policy of eco-

nomic selective logging, governed by sound silviculture, is resulting in a balancing of age classes and a reduction of timber losses from pine beetles. Pine beetle infestation on the Yakima and Warm Springs Reservations has been diminished through the application of artificial control, prosecuted in cooperation with the Civilian Conservation Corps—Indian division. Finally, a handbook of fire control has been formulated and approved which will help to reduce losses from fires.

All of these accomplishments have been effected without a material reduction in the revenues flowing from Indian lands, without any increase in the appropriations of the organization principally responsible for the practice of conservation thereon, and with the cooperation of the Indians. Opposition to essential stock reduction programs and to conservative selective cutting of Indian timber has made itself manifest, but conservative opinion has in general prevailed among Indian groups.

DEMAND FOR INDIAN TIMBER REVIVES

Owing to an upward trend in the production of lumber during the year 1936 a demand for Indian timber has again developed and many applications to purchase timber have been received and considered. Only a limited number of small sales was consummated, however, and these were authorized principally as salvage operations to reduce losses being sustained through the activities of the western pine bark beetle. Several comparatively large sales were under consideration for advertisement by the Indian Office and the Department at the close of the fiscal year; it is expected that some of these units will be placed on the market in order to meet the needs of the Indians and salvage timber which is being destroyed by the beetles.

TIMBER CUT BRINGS \$1,413,004.97 TO INDIANS

Approved existing contracts continued in full operation during the year, producing a total volume cut of 414,591,243 feet, board measure, and a gross return of \$1,413,004.97 to the Indians. Returns on the reservations of major importance from a forestry standpoint for the fiscal period were, in order of volume, as follows:

Reservation	Volume cut, board feet	Value of tim- ber cut
Klamath Agency, Oreg.....	181, 635, 540	\$663, 158. 94
Quinalt (Taholah Agency) Wash.....	75, 030, 600	195, 197. 35
Menominee Agency, Wis.....	29, 843, 660	105, 800. 07
Spokane (Colville Agency), Wash.....	27, 491, 620	75, 231. 65
Fort Apache Agency, Ariz.....	24, 079, 360	71, 564. 53
Colville Agency, Wash.....	22, 264, 770	64, 299. 21
Consolidated Chippewa, Minn.....	17, 564, 546	125, 607. 77
Kalispel (Northern Idaho Agency) Idaho.....	9, 825, 590	37, 370. 26
Mescalero Agency, Ariz.....	8, 600, 480	25, 236. 53
Makah (Taholah Agency) Wash.....	7, 138, 190	9, 930. 18
Flathead Agency, Mont.....	3, 913, 680	11, 997. 92
Red Lake Agency, Minn.....	3, 112, 840	16, 282. 49
Hoopa Valley Agency, Calif.....	2, 823, 967	7, 282. 19
Jicarilla Agency, N. Mex.....	690, 310	2, 416. 09
Crow Agency, Mont.....	288, 400	891. 03
Tulalip Agency, Wash.....	287, 690	738. 76
	414, 591, 243	1, 413, 004. 97

INDIAN SAWMILLS MAKE SHOWING

The Menominee Indian Mills of Wisconsin and the Red Lake Indian Sawmill of Minnesota again closed their books on a successful operating year. They were successful not merely from the standpoint of profit-taking—although the results in that connection were not insignificant—but also from the standpoint of Indian industrialization, Indian wages earned, and Indian progress realized. They were successful, moreover, in that the natural resources under development have been so exploited that their use today has in no way made less likely continued enjoyment tomorrow.

SOIL CONSERVATION PRACTICES ON INDIAN LANDS

In the Navajo and Pueblo regions, under Indian Service leadership, the Government's work has become a compound of the work of the Departments of Agriculture and of the Interior. The union of services was commenced in both areas while the Soil Conservation Service was under the Department of the Interior. It was continued after the transfer of the Soil Conservation Service to the Department of Agriculture. The administrative control in each of these areas rests with the Indian Service superintendent. Land-use planning is the primary function of the Soil Conservation Service in the set-up, but in addition, demonstrations and operations are carried forward by it. In the Navajo area, the Bureau of Animal Industry plays a vital role, while in the Pueblo area, through Indian Service initiative, there has been built up a committee on problems of the Rio Grande watershed, with a representative of the Indian Service as chairman, which draws together in diverse relationships the contributions of the grazing district, the General Land Office, the Indian Service, the Resettlement Administration, the Soil Conservation Service, and the Forest Service. The committee's assignment is to find out how the dense rural and village population of Indians and Spanish-Americans can be enabled permanently to subsist itself through utilization of the land and water of a gravely depleted watershed—that of the Rio Grande in central and northern New Mexico.

Practically, the work in the Pueblo country amounts to a total enterprise of regional planning, and it points toward a more integrated regional administration in times immediately to come.

A most interesting circumstance in the Navajo and the Pueblo areas, of course, is the consciousness of and sustained cooperation by the Indians themselves in the tasks of planning and execution. Probably no white groups have made, voluntarily and swiftly, economic readjustments so drastic as have been made in the last 2 years by the Pueblos of Acoma and Laguna and by the Navajo Tribe.

PHYSICAL WORKS IMPROVE RANGE

On the Navajo Reservation and in the Pueblo jurisdiction, the Soil Conservation Service has made detailed plans for range management, erosion control, and the consequent economic adjustments. In both areas, the Soil Conservation Service has constructed extensive works for the control of run-off, spreading of flood waters, the extension of flood irrigation, and for various types of range improvement. On the Navajo Reservation, the Soil Conservation Service has established a demonstration and experimental area covering almost 100,000 acres.

Cooperative range improvement and erosion control work was undertaken by the Soil Conservation Service on the Shoshone Reservation in Wyoming and on the Warm Springs Reservation in Oregon.

SURVEYS FURNISH BASIC ECONOMIC DATA

In December 1935 the Soil Conservation Service organized, in cooperation with the Indian Service, a unit of technicians for making physical and human surveys of various reservations for the purpose of producing plans and programs in the execution of which the Indian Service would bring about a better and more complete use of reservation resources. The basis of these programs was the introduction and application of land-use practices which would check erosion and bring about not only the full development but also the conservative management of Indian resources.

At the end of the fiscal year 1937, surveys had been completed and land-use plans made for Havasupai, Papago, Pima, and Walapai Reservations in Arizona, the Mescalero Reservation of New Mexico, the Shoshone Reservation in Wyoming, and the Uintah and Ouray Reservations in Utah; range management plans for seven of the Pueblos had been completed by this cooperative unit and surveys had been started on eight additional reservations.

EXTENSION WORK EMPHASIZES LIVESTOCK

Severe drought again prevailed on eastern Montana, Dakota, Nebraska, and Oklahoma reservations. In these areas, a good many cattle and other livestock which ordinarily would have been retained for breeding stock, were sold for lack of forage. The cumulative effect of drought in these States has been disastrous.

The emphasis during the past year on conservation, economic rehabilitation, and the organization of Indians for the extension of credit has thrown extra burdens on the Extension Division.

INDIAN LIVESTOCK INDUSTRY SET BACK BY DROUGHT, GAINS ARE EVIDENT SINCE 1933

Extension workers have put special emphasis on helping Indians to build up their livestock industry.

The 12 States of Arizona, Colorado, Idaho, Montana, New Mexico, North Dakota, South Dakota, Oregon, Utah, Washington, and Wyoming, contain some 46,568,000 acres of Indian land, or about 90 percent of all Indian-owned land. Approximately 80 percent of this area is range land.

The tables below ¹ show that the number of Indians owning dairy cattle and the number of such cattle decreased slightly in 1936; and that the number of Indians owning beef cattle decreased slightly although the number of cattle increased by 3,628 head over 1936. The figures, comparing 1935 and 1936, should be considered in conjunction with the fact that 70,664 head were sold or slaughtered, as compared with 54,827 in 1935.

Dairy Cattle

	1933	1934	1935	1936
Number of Indians owning.....	6,336	9,133	8,556	8,476
Total number owned.....	16,406	25,711	20,966	20,624
Average value per head.....		\$23.07	\$37.85	\$38.30
Total value.....		\$593,127	\$793,526	\$789,892
Number live animals sold.....	252	2,171	1,001	1,415
Amount received.....	\$3,603	\$36,008	\$22,229	\$29,529
Pounds dressed meat sold.....		3,500	10,151	5,400
Amount received.....		\$245	\$1,235	\$530

Beef Cattle

	1933	1934	1935	1936
Number of Indians owning.....	8,627	13,787	13,812	13,159
Total number owned.....	167,313	229,343	233,974	237,602
Average value per head.....		\$18.95	\$31.10	\$29.53
Total value.....		\$4,346,307	\$7,276,265	\$7,015,443
Number live animals sold.....	12,284	36,046	44,766	46,718
Amount received.....	\$210,609	\$578,070	\$1,305,875	\$1,158,524
Pounds dressed meat sold.....	793,063	547,179	880,947	610,688
Amount received.....	\$52,486	\$44,820	\$86,114	\$62,778

Total income received from cattle: 1933, \$266,698; 1934, \$659,143; 1935, \$1,415,453; 1936, \$1,251,371.

The beef cattle table shows a greater number of cattle sold in 1936 than in 1935, and the income from those sold in 1936 less than that received in 1935. This was due largely to the number of Indian cattle forced onto the market in poor flesh, bringing only prices paid for common and canner cattle.

Cattle for foundation herds.—The greatest impetus in the livestock industry was gained during the winter of 1934–35 and fall of 1935, when a total of 42,100 head of cattle was obtained from various sources for issue to Indians as foundation herds in order to give them a start in the livestock business. These cattle were issued

¹ All figures in this section are for calendar years.

under contracts providing for the return of a yearling heifer of like quality within a certain number of years. The repayments will, in turn, be issued to other Indians under similar contracts. A revolving pool of cattle has thus been established, and to date, over 7,000 additional cattle have been supplied to Indians from this pool. In time, it should be possible for all Indians who want to undertake cattle raising to obtain an economic unit from this pool.

Indians are using their own range.—The Indians have been leasing the bulk of their grazing lands to whites because they have had no sources of credit or other means of getting a start in using their own land. As the livestock industry is built up, and the Indians have use for their own lands, lands are being withdrawn from further leasing and are being held exclusively for Indian use. The following table will show the increase in Indian use of grazing lands in a 2-year period, 1934–36, on a number of reservations:

Acreage Grazed by Indians

	1934	1936
Blackfeet, Montana.....	44,926	324,531
Crow, Montana.....	62,343	142,334
Fort Belknap, Montana.....	177,788	285,250
Fort Berthold, North Dakota.....	173,102	285,325
Fort Hall, Idaho.....	80,000	171,900
Fort Peck, Montana.....	80,550	102,510
Klamath, Oregon.....	502,411	544,306
San Carlos, Arizona.....	1,088,330	1,422,519
Shoshone, Wyoming.....	244,138	536,531
Standing Rock, North Dakota.....	75,231	110,568
Yakima, Washington.....	190,050	310,269

Cooperative livestock associations show marked increase.—The most important development in the Indian livestock field, perhaps, has been the marked increase in Indian initiative and management. Indians, through cooperative livestock associations, are managing controlled grazing, round-ups, sales, and other business affecting their livestock enterprises. Cooperative livestock associations have increased from a comparatively small number in 1933 to 53 in 1935 and to 119 in 1936. These 119 associations, at the end of 1936, had a total membership of 4,476 and owned 123,061 head of cattle.

Sheep and goats.—The reduction program was continued on the overstocked and overgrazed Navajo Reservation. The dipping records of the Bureau of Animal Industry show the following comparative figures in the number of sheep units: ¹ 1933, 1,013,606; 1934, 942,059; 1935, 801,406; 1936, 724,336.

In spite of the decrease in the number of sheep in the Southwest, increases were recorded in the totals for all other reservations.

¹ The term "sheep unit" here includes grown sheep, lambs, rams, goats, and kids. Lambs and kids are figured on the basis of 2 for 1 grown animal. The term does not here include cattle and horses. When these are added, the Navajo range is found still to be carrying an overload of several hundred thousand sheep units.

The Southwestern Range and Sheep-Breeding Laboratory, Wingate, N. Mex.—The object of the laboratory-research program is to develop a strain of sheep with a type of wool suitable for Navajo handicraft and having a ready commercial market, but which also will produce more mutton than existing Navajo sheep while retaining their hardiness and ecologically adaptable characteristics.

The research program is now under way. There are 1,342 sheep at the laboratory, of which 629 are ewes. These are divided into five groups varying in size from 116 to 155 head. The groups are again divided into some 16 pens, according to fleece qualities and body conformation, each pen being bred to rams which have been selected for making improvements in wool and mutton in keeping with the purposes of the laboratory.

A Navajo Indian weaver has been employed to weave blankets from the various grades of wool as a test of their suitability for the production of Navajo rugs.

Other livestock.—A total of 78 purebred stallions and 1,484 mares were purchased. A total of 5,895 horses, mules, and burros were sold, most of which were wild or of little value. At the close of 1936, 29,550 Indians owned 115,006 horses, mules, and burros.

In 1936 poultry owned by Indians totaled 355,461. This figure is an increase over that of 1935, in spite of severe drought on more than 20 reservations. The number of birds consumed and the number marketed also increased; the number of Indians owning poultry, however, decreased.

Approximately 53 percent of the swine owned by Indians are on Oklahoma reservations where drought conditions continued. The number of Indians owning swine decreased from 5,153 in 1935 to 4,799 in 1936 and the number owned decreased from 23,573 in 1935 to 19,981 in 1936.

INDIAN FARMERS FIGHT DROUGHT AND INSECTS

Continued crop failures have forced many Indians to turn to Government-financed relief projects for a livelihood. The acreage farmed by Indians has decreased since 1933, and further decreased by 11.8 percent in 1936. In spite of the fact that many Indians have had to abandon farming for wage work, it has been heartening to notice the voluntary drop on many reservations in E. C. W. employment every spring, due to the Indians' wishes to try once more to get something out of their farms.

A total of 514,529 acres was cultivated by Indians during 1936. The irrigated acreage cultivated by Indians increased from 149,043 acres in 1935 to 192,997 acres in 1936, or 29.4 percent. The acreage planted to cereal crops was 244,135 acres, a slight increase over 1935, but the severe drought that prevailed in large areas decreased yields

by 32 percent. Cotton yields decreased 25 percent and sugar beets 28 percent from 1935. Because of emphasis placed on the necessity of growing forage crops for livestock feed the acreage planted increased 53 percent over 1935; however, drought greatly reduced yields.

Insects and drought completely wiped out gardens in many sections of Oklahoma and the Great Plains.

LOCAL EXTENSION ORGANIZATIONS SPREAD KNOWLEDGE OF MODERN PRACTICES

Increased membership in 4-H clubs, farm chapters, and women's clubs has meant a spread of ideas of self-help and agricultural progress. Self-help centers are being established, where Indian women are taught to can and preserve food, to make clothes, and to learn sound practices in nutrition and home management. Last year's totals in food preservation are impressive: 393,843 quarts of fruit; 55,183 of meat; 264,964 of vegetables and 51,062 quarts of fish. In addition 124,636 pounds of fruit were dried; 122,992 pounds of meat; 617,763 pounds of vegetables; and 135,980 of fish. Indian women made 142,710 pieces of clothing under auspices of home-extension groups.

Indian leadership is developed at these centers, and through them it is possible to reach a large number of homes with a small number of trained workers.

INCREASES IN INDIAN OPPORTUNITY THROW ADDITIONAL BURDEN ON EXTENSION STAFF

The attainment of the goal of self-support by the Indians is, to a very large degree, dependent upon a successful extension program. The fewness of the extension staff, however, makes it impossible for the Indians to receive the amount of help they seek and need. The developments which are taking place on most of the Indian reservations—soil conservation work, Emergency Conservation Work, new irrigation developments, rehabilitation enterprises, the organization of Indians under the Indian Reorganization Act, credit and other benefits derived from that act, land purchases, and the setting up of a cattle pool of some 35,000 head of cattle for the restocking of Indian ranges—have created a situation on many reservations which makes it essential that additional extension personnel be provided if the Indians are to receive the full benefits of the expenditures which have already been made and are to be made.

IRRIGATION WORK EMPHASIZES SMALL SUBSISTENCE PROJECTS

The Indian Service's Irrigation Division seeks to fit irrigation and water development into the general reservation programs of resources utilization and of increased self-help by Indians. Activities of the Division include development of water supplies for stock and

domestic use and the design, construction, and operation of irrigation systems.

The development of water supply for stock and domestic use during the past year has been confined to the Navajo, Hopi, Pueblo, and Papago areas in Arizona and New Mexico, together with some small developments in California and the Great Plains area.

SEVENTY-FIVE COMMUNITY GARDENS DEVELOPED

A program of subsistence garden development around which the Indians could build up their cattle and stock industry was inaugurated in 1935 with funds provided by the Public Works Administration. This work is being continued with congressional appropriations augmented by E. C. W. labor.

These small subsistence developments are confined exclusively to Indian-owned land. (The larger irrigation projects include both Indian and privately owned land.) At the end of 1936 a total of 75 gardens had been developed, totaling 813 acres. During the growing season of 1936, 31 of these gardens produced approximately 350,000 pounds of vegetables with a market value of \$8,000.

CONSTRUCTION COSTS TO AVERAGE LESS THAN \$100 PER ACRE

Recent studies indicate that there are approximately 1,200,000 acres of irrigable land within the present Indian irrigation projects, of which about 500,000 acres have been provided with irrigation facilities and have an adequate water supply. The total construction cost to date is approximately \$50,000,000 and the estimated cost of completing all work now planned for the ultimate irrigable area of 1,200,000 acres is \$50,000,000. The work now planned includes not only supplemental storage and the extension of irrigation facilities, but also the expenditure of approximately \$5,000,000 for assisting the Indians in the subjugation of their lands. The completion of this program will result in an average construction cost of less than \$100 per acre, including the subjugation work.

INDIANS' AND LESSEES' USE OF INDIAN OWNED IRRIGATED LAND

Out of the 500,000 acres now supplied with irrigation facilities and for which there is an adequate water supply, some 470,000 acres were irrigated last year, of which 150,000 acres were irrigated by 7,600 Indian families; 120,000 acres of Indian lands were farmed under lease; and 200,000 acres were in white ownership. Actual use of the land by Indians is increasing. The following tabulation shows the actual use of irrigated land in Indian irrigation projects during the calendar years 1934, 1935, and 1936:

Year	Acres Indian operated	Acres Indian leased	Acres privately owned	Total
1934.....	139,868	102,094	193,523	435,485
1935.....	140,788	108,435	198,088	447,311
1936.....	147,264	117,178	197,995	462,437

PROJECTS APPROXIMATELY SIXTY PERCENT SELF-SUPPORTING

Funds available for irrigation and water development activities during the fiscal year 1937 totaled \$3,324,164 of which \$1,156,664 was from appropriations for regular operation and maintenance, \$780,900 from appropriations for construction and \$1,386,600 from allotments made by the Public Works Administration. All appropriations for irrigation development are reimbursable by the lands benefited. Under the Leavitt Act of July 1, 1932 (47 Stat. 564), however, no construction assessments are made against Indian lands as long as the lands remain in Indian ownership. Annual irrigation operation and maintenance charges are collected from all Indians who are considered financially able to make payment. Most of the smaller projects are operated by the Indians themselves with some assistance in the way of supervision and the furnishing of materials and supplies, and on the larger projects the Indians are permitted to work out the annual charges which amount to from 50 cents to \$2 per acre. All privately owned lands within these projects pay their proportionate share of both operation and maintenance charges and construction charges and Indian lands leased pay their proportionate share of the operation and maintenance assessments.

LARGE PROJECTS CARRIED FORWARD IN SIX STATES

The principal construction activities during the year, carried on with allotments made by the Public Works Administration, consisted of the construction of a storage reservoir in the Owyhee River, Duck Valley project (Nevada), the construction of an equalizing reservoir on the Fort Hall project (Idaho); the completion of the distribution system to Indian lands on the San Carlos project (Arizona); the beginning of construction of a pumping plant to serve 13,000 acres on the Fort Peck project (Montana); the construction of a storage reservoir on the Flathead project (Montana); continuation of drainage work on the Wapato project (Washington); and miscellaneous construction work in the Navajo and Pueblo areas (Arizona and New Mexico).

INDIAN EMERGENCY CONSERVATION WORK GIVES WAGE WORK AND BUILDS UP INDIAN RESOURCES

Of fundamental importance in the revitalization of Indian life has been the Indian Emergency Conservation Work. It has given wage work where relief was desperately needed. But its importance has not only been its relief aspects. Rather, it has made possible the systematic conservation and building up of reservation resources. The work has gone on long enough for Indians themselves to see results and to sense the economic potentialities of their holdings. The rise in morale achieved through the consistent policy of encouraging participation of tribal councils in planning the work, and of advancing capable Indians into responsible positions, has been as important a result as the actual physical improvements.

I. E. C. W. ended its fourth and final year on June 30, 1937. Henceforth this activity will be known as the Civilian Conservation Corps, Indian Division.

The sum of \$8,914,000 allotted for the work in 1937 was a slight decrease from that received during the fiscal year 1936.

ENROLLMENT AND EMPLOYMENT

More than 50,000 Indians have participated in Indian emergency work since the beginning of the work in June 1933. The total daily number of men on the pay roll during the past 4 years has been approximately 8,500, and more than 11,500,000 calendar days have been worked. At some of the agencies it was necessary to stagger employment.

Indians have been given preference in supervisory and facilitating positions, when qualified. There are not many Indians technically trained. However, a large number of group foremen, mechanics, machine operators, camp assistants, and assistant foremen are Indians. The employment record for skilled, facilitating, and supervising positions shows 540 Indians as against 436 whites, for the 4-year period.

Wages for Indian enrollees have been, as in camps for whites, \$30 per month, plus board, lodging, and clothing, or a commutation of \$15 per month when the worker lives at home and provides his own meals.

The family camp continues to be popular. Reservation staffs have helped these groups in their social, sanitation, and health problems.

HEALTH GOOD, ACCIDENTS FEW

E. C. W. staffs have worked hard on safety and health programs. There were very few deaths during the past year; there was some illness and a few accidents. Red Cross aid continues to be given; first-aid schools have been encouraged and life-saving courses have been held.

PRODUCTION ACCOMPLISHMENTS SHOW VARIED CONSERVATION PROGRAM

According to an announcement made a few months ago by the office of the director, Mr. Robert Fechner, the conservation program of the United States has been advanced at least 20 years by the work of the Conservation Corps. This is also true of the Indian program. The record of work done is impressive. Conservation has been emphasized: Water development, prevention of soil erosion, and similar projects have improved reservation lands. Major activities undertaken during the past 4 years follow:

Telephone lines.....	miles..	5, 636. 7
Firebreaks.....	do.....	2, 282. 8
Truck trails.....	do.....	6, 420. 6
Horse trails.....	do.....	2, 019
Fences, 2,576,431 rods or.....	do.....	7, 863. 5
Springs, small reservoirs, and well development.....	units..	6, 909
Impounding and large diversion dams.....		922
Insect and tree pest control.....	acres..	911, 394
Erosion control, check dams:		
Permanent.....	units..	16, 402
Temporary.....	do.....	50, 474
Bridges:		
Vehicle.....	do.....	659
Stock.....		226
Corrals.....	units..	141
Elimination useless range stock.....		269, 836

Reservation values have been substantially increased; the work has been urgently needed and well done.

APPROXIMATELY 70 PERCENT OF FUNDS SPENT FOR WAGES

Pay-roll items (actual wages and emoluments) total 69.7 percent of the funds spent during the 4-year period. Emoluments include shelter and subsistence, commutation thereof, feed and hire of teams. Purchases of heavy equipment total 7.7 percent. Supplies and materials accounted for 15 percent. Heavy equipment definitely increased the amount of work accomplished, and had little, if any, unfavorable effect on the employment of Indians.

LEISURE-TIME PROGRAMS GIVE INDIAN ENROLLEES VALUABLE TRAINING

After working hours, programs of recreation and education for Indian enrollees have been maintained. Training on the job has been emphasized. Most of the educational enterprises has been vocational rather than academic. The regular employees of the Indian Service have generously volunteered their services to assist in the program.

SAVINGS ACCUMULATED BY INDIANS

More than \$1,800,000 has been deposited in individual Indian money accounts during the past 4 years. Household equipment, live-stock, farm equipment, and clothing have been purchased from these savings; homes have been repaired and new ones constructed. A substantial balance remains for later use.

"INDIANS AT WORK"

The pamphlet "Indians At Work" has become increasingly popular. It is liked by the Indians, and is read with regularity by them.

RELIEF AND REHABILITATION PROGRAM MAKES A BEGINNING IN IMPROVING LIVING CONDITIONS

The Indian relief situation had been crucial even before the depression. Early in the present administration a partial survey of the housing and economic condition of Indians emphasized the fact that a large number were in desperate straits—landless, miserably housed, and without means of support. While direct relief was being provided, and, after 1933, work relief, there were no funds for attacking this fundamental problem of housing and economic rehabilitation until the passage of the Emergency Relief Act of 1935 and the subsequent allocation to the Indian Office by the President, in January 1936, of \$2,000,000 of emergency funds.

Later reduced by retransfers to the Treasury to a total of \$1,767,027, these funds were used as follows: For direct relief, \$336,323; for rehabilitation, \$1,360,500; for administration, \$70,204. In March 1937, additional funds were made available to the Indian Office as follows: \$498,000 for field projects, and \$39,000 for administration.

By the terms of the Presidential allocation, the rehabilitation funds were to be used for the following purposes:

To finance the rehabilitation of Indians in stricken rural agricultural areas by means of loans or grants, or both, to enable them to construct or repair houses, barns, outbuildings, and root cellars; to develop wells and springs for domestic water; to clear and improve land for gardens and small farms and to purchase land for such purposes when necessary; to make furniture and other handicraft products; and to establish, maintain, and operate other small self-help projects.

VARIED CONSTRUCTION AND COMMUNITY PROJECTS UNDERTAKEN

As of June 30, 1937, the rehabilitation program had accomplished the following:

Building Construction Projects

Houses, new.....	874	Poultry houses.....	160
Houses, repairs.....	1, 711	Combination cow shed and poul-	
Barns.....	148	try houses.....	37

Building Construction Projects—Continued

Woodsheds-----	10	Smithies and woodworking shops-----	7
Combination garage and woodsheds-----	58	Combination self-help project buildings, new-----	82
Toilets-----	999	Combination self-help project buildings, repairs-----	25
Hog houses-----	61	Combination carpenter shop and canning kitchen-----	1
Cattle sheds-----	5	Combination corral and shearing shed-----	1
Root cellars-----	79	Corrals-----	10
Combination root cellar and smoke house-----	2	Shearing sheds-----	2
Flour and grist mills-----	8	Blacksmith shops-----	12
Granaries-----	5	Provision and supply depot (sheep industry)-----	1
Canneries-----	3		
Sorghum mills-----	3		
Machine sheds-----	5		

Water and Land Development Projects

Gardens-----	15, 066	Miscellaneous land improvements-----	13
Irrigation-----	11		
Water development-----	587		

Self-Help and Miscellaneous Projects

Canning and sewing-----	26	Fencing-----	66
Canning and sewing equipment-----	67	Hide tanning-----	1
Hay press-----	1	Weaving-----	1
Portable caldrons-----	3	Equipment and tools for arts and crafts-----	1
Sawmills and logging-----	6	Agricultural machinery-----	3
Dipping vats-----	73	Shearing machines-----	2
Furniture and handicrafts-----	7		

Projects were conducted at 68 agencies, situated in 23 States. On April 30, 1937, the Indian rehabilitation program had furnished 1,421,384 man-hours of employment at an estimated man-year cost of \$963. As of June 17, 1,352 needy Indians requiring employment were being given work.

NEED FOR REHABILITATION WORK CONTINUES

The rehabilitation program has been of the utmost importance in caring for cases of desperate need, in restoring initiative and morale, and improving opportunities for community and family self-support. Concerned as it is with permanent improvements in the way of housing, farm buildings, self-help buildings, self-help enterprises, and the development of land and water resources, the rehabilitation program is particularly designed to help Indians toward a level of economic self-sufficiency and decent living. By improving the Indians' economic status, rehabilitation work should ultimately be reflected in lessened gratuity appropriations for relief and support.

ROAD WORK IMPROVES RESERVATION CONDITIONS; AFFORDS RELIEF

In its road program the Indian Service has sought to develop adequate reservation road systems, and, as was contemplated by Congress, to provide employment for Indians and to train Indians gradually for technical positions in road building.

COSTS OF RESERVATION ROADS HAVE BEEN LOW

Reservation road programs are headed by qualified, experienced road engineers. All Indian Service projects are examined and approved as to location, type, and design by the Bureau of Public Roads, whose requirements have sharply increased Indian Service road engineering costs.

Accomplishments during the fiscal year ending June 30, 1937, with the \$3,500,000 provided by Congress for Indian road work follow:

Roads:

Improved.....	879. 07
Surfaced.....	597. 34
Total (miles).....	1, 476. 41

Bridges:

Constructed.....	193
Repaired.....	207
Total.....	400

Culverts:

Constructed.....	2, 272
Repaired.....	263
Total.....	2, 535

Maximum number of people employed on road work during the year..	11, 655
Total man-hours of work furnished during the year.....	4, 039, 505
Average earnings per hour.....	\$0. 457

A result which cannot be measured statistically is the increased proficiency of Indian employees in surveying, drafting, and other technical work. Indians in increasing numbers are qualifying for responsible road jobs. Approximately 70 percent of road expenditures go for wages.

NEED FOR ROAD WORK CONTINUES

The need for road-improvement work on Indian reservations is of continuing urgency. Congress recognized in two acts (acts of June 19, 1934, and June 16, 1936) that \$4,000,000 are annually required for road work on nearly 200 Indian reservations in 24 States, for this purpose; but the full amount authorized has not been appropriated in every year. Little or no help from the States or counties or townships can be expected for roads built for Indian use; consequently

this task will remain a permanent obligation of the Federal Government.

Following past practice, part of the road appropriation was used to purchase machinery, so that now the Indian Service has a modest amount of modern and efficient road-construction machinery. Garages and storage sheds have also been constructed at most jurisdictions for the repair and preservation of valuable equipment and machinery. This Service is organized to carry on road construction and improvements at low costs; and in cooperation with the Bureau of Public Roads, it has made surveys and plans for a 5-year future road-construction program.

ROADS ARE FOR RESERVATION USE—NOT DESIGNED FOR TOURISTS

The Indian Service has refused to construct or authorize the construction on reservations of tourist roads which would mean the exploitation of Indian life and culture. Moreover, the Service does not approve of road construction into wilderness areas which will better serve the Indians and the public if left unmolested. But the Service does seek to build reasonably good roads for reservation use. The day-school program, especially, hinges upon roads adequate for daily bus service; and the health program, in attempting to reach out into Indian communities, depends on passable roads. We are resisting the pressure to build roads of more costly and elaborate type than present or prospective use can justify.

CONSTRUCTION

With the exception of appropriations continued available for the construction of public-school buildings, and for the Sioux sanatorium in South Dakota, all building and utility construction work during the fiscal year 1937 was carried on as a part of the Public Works program. Ten public-school buildings were completed in the Northwest district and three more are nearing completion.

A number of large and important projects were completed during the year. Among these are the hospitals at Sisseton and Yankton, S. Dak., Cass Lake, Minn. and Crow Agency, Mont. Contracts were let during the year for the combined general hospital and tuberculosis sanatorium at Talihina, Okla., and for the hospital and laboratory building at Fort Defiance, Ariz. Completion dates for these two projects are March 18, 1938, and November 8, 1937, respectively. The Sioux Sanatorium at Rapid City, S. Dak., also being constructed by contract, will be ready for occupancy on January 1, 1938.

Except for buildings being erected under contract, the Public Works construction program was completed as of June 30, 1937. The construction program for the fiscal year 1938 will be financed from an

appropriation of \$2,047,500 contained in the regular Interior Department appropriation act. This change from emergency to regular funds necessitates the replacing of all Public Works employees with persons selected from the civil service registers. The personnel in the three field construction offices (located at Albuquerque, N. Mex.; Billings, Mont.; and Muskogee, Okla.) will be reduced to the minimum number necessary to take care of the program for 1938. It is hoped that the shift from emergency to regular employees can be completed by September 30, 1937, and that the new program can be well under way before the cold winter weather sets in.

INDIAN ARTS AND CRAFTS DEVELOPED AS PART OF INDIAN LIFE AND ECONOMY

One of the characteristics of the American Indian is his outstanding ability as a craftsman. Unfortunately, however, most Indian arts and crafts products have been marketed in a haphazard fashion, and returns to the Indian producers have been low. The wide variations in quality and the uncertainties of production have made large-scale marketing difficult.

With the objective of building up this potential resource and increasing revenues from it while maintaining its integrity, this administration sought the passage of an arts and crafts bill which would provide funds and personnel for working out better production and marketing methods. Such an act was passed August 27, 1935 (49 Stat. 891), and the Indian Arts and Crafts Board was appointed during the following year. Broad powers are given the Board in the execution of its functions, but it may not itself act as a dealer.

"QUALITY" MARKET SOUGHT FOR INDIAN CRAFTS

After 6 months of extensive study in the field covering both production and marketing conditions, the Board found itself prepared last January (1937) to define its general policies and to initiate its first concrete projects.

In its work with the producer, it is the Board's policy to make raw materials available; to stimulate quality production and to help in the organization of craftsmen groups; to supply craftsmen of tribes having traditional handicrafts with all available information on techniques formerly used by their tribes and to acquaint them with the exigencies of the current market; to those groups having no traditional handicrafts, an opportunity to learn industries is to be given. In its work with the local dealers, it is the Board's policy to encourage emphasis on quality work and to help in establishing business relations with a quality market. Stimulation and actual cooperation in the organization of exhibits of Indian arts and crafts, stimulation of

publications on Indian arts and crafts and establishment of an educational service for sales forces of stores carrying Indian crafts goods are included among the Board's plans for promotion work in the ultimate market.

LOCAL PROJECTS ARE INITIATED

The following specific projects have been initiated by the Board.

Silver project (Navajo, Pueblo, and Hopi Reservations, N. Mex. and Ariz.).—Standards of genuineness and quality for the silver work of the Navajo, Pueblo, and Hopi Indians have been established and published. A Government stamp, to be applied only to pieces that meet these standards, has been devised.

The loan of expert Navajo teachers of silversmithing from the Division of Education of the Indian Service has been arranged. These men are serving as advisers to reservation silversmiths who wish to produce the highest type of jewelry. Private groups are supplying the workmen with raw materials and adequate wages. Even after visits to all local dealers, no work of a quality equaling the products of the teachers and their students (with the exception of old pieces) has been found to be on sale. The Board believes that this project will not only produce a better source of income for the best silversmiths, but will also create a demand for better jewelry and thus stimulate the production and trade for more profitable merchandise all over this region.

Navajo textile project.—A certificate of genuineness for Navajo textiles has been devised, to be attached to such fabrics as are made only of wool and woven in the traditional Navajo manner.

Textile home-industry project (eastern Oklahoma).—To extend the Board's activities into regions where the traditional crafts work has but little sales appeal or has been completely lost, staff members of the Board made a special survey of this region. As a result, plans have been made to introduce home industries that will give the workman a chance to profit from his manual skill and, at the same time, give him an opportunity to develop a characteristic style of his own.

The first home industry to be developed in the Oklahoma region is the making of hand-spun yarn. Inquiries on the market have shown that most of the homespun yarn used in the United States today is imported from foreign countries and is available only at a very high price. The Board has asked the Education Division of the Indian Service for the loan of an expert spinning teacher as instructor, and hopes later on to help in the organization of an Indian cooperative or credit association to carry on the work on a commercial basis. The Board also will cooperate in the development of sales outlets for this commodity. It is expected that this project will be widened in the future to include rug making and weaving.

Arts and crafts group project (Western Oklahoma).—In recognition of the strength of the old traditional arts and crafts societies in this region, the Board has initiated projects based on group work. A staff member of the Board has encouraged the formation of fairly large groups of Indians interested in improving the quality of the traditional arts of their tribes. In Shawnee and in Anadarko, production has already started in cooperation with the local Indian Service agencies and organized groups of local businessmen who have recognized the value of a development of finer Indian products as of definite value to the whole region. Beadwork and leatherwork are the principal products to be made under these projects.

Experimental laboratory, Tesuque, N. Mex.—A small laboratory was in operation last spring at Tesuque to experiment with the production methods of weavers, tanners, and silversmiths from various reservations. It was the purpose of this laboratory to help the craftsmen to find out what specific types of raw material are best fitted for their purposes and what production methods bring the best results.

Legal protection of Indian products against unfair and fraudulent advertising methods.—With the aid of the United States district attorney of the territory involved, the use of misleading labels on one type of imitation Indian jewelry has been stopped; another case of the same kind is in the hands of the attorney now. Two cases of false newspaper advertising have been referred to the Federal Bureau of Investigation for appropriate action.

Indian exhibit at Paris World's Fair.—An Indian exhibit at the World's Fair in Paris this summer was arranged through the cooperation of the Board with the American Federation of Arts, which was in charge of the exhibition of American handicrafts.

Plans begun for Indian exhibit at World's Fair in San Francisco in 1939.—Representatives of the Indian Arts and Crafts Board have conferred with the world's fair authorities and interested private groups in San Francisco on an Indian exhibit at the Golden Gate International Exposition in 1939. A staff member of the Board helped to outline a plan for an exhibit that for the first time will show the whole scope of the Indian's artistic ability in a dignified, dramatic manner. This display will be more comprehensive than any ever held.

EDUCATION OF INDIAN CHILDREN

BUILT AROUND FLEXIBLE PROGRAMS, SUITED TO VARYING CONDITIONS

The policy of the present administration has been to give consideration to the human factors which govern relationships between racial groups.

IMPLEMENTING AN EDUCATIONAL POLICY

The new pattern of education for the Indians attempts to adjust the school program to the needs of the Indian community, recognizing and preserving significant factors in Indian life and aiding in adjustment to white culture at points where such adjustment appears inevitable. However, it is not enough to declare that a new policy is in order. It must somehow or other be incorporated into the living of a staff which for many years may have been practicing quite the reverse. Therefore, in order to give positive effect to the new policies, it has been necessary to develop agencies for in-service training.

In-service training through summer schools.—During the summer of 1936 the Education Division of the Indian Office operated two in-service training institutes: One at Pine Ridge, S. Dak.; the other at Wingate, N. Mex. Courses in anthropology, philosophy of Indian education, rural sociology, Indian arts and crafts, and in the vocational, agricultural, and home-making needs of the several areas studied were offered. Demonstration schools were operated in which the very difficult subject of teaching English to non-English speaking native children was made a prime concern. Opportunity was given for teachers in the Service to learn something of the Sioux or the Navajo language. Each institute operated for 6 weeks, and 404 teachers in all were reached. Through arrangements with a number of first-rank American colleges, teachers were enabled to secure college credit toward an undergraduate or graduate degree. In response to requests from the field, this summer training program was extended for the summer of 1937, and four schools were operated. The program was repeated at Pine Ridge and Wingate, and two new centers at Sequoyah and Chilocco in Oklahoma were added. Demonstration schools were organized at each of the four centers, and a total of 972 educational personnel was served. In addition 27 teachers were registered from public schools outside of the Indian Service which enroll Indian children.

Apprentice training aids young Indian teachers.—In carrying out the policy of enlarging the number of Indians employed in the Service, a program of apprentice training for Indian college graduates trained in education was inaugurated in the fall of 1936. A dozen young Indians showing better than average potentialities for teaching were placed with a selected group of superior Service teachers to increase their probabilities for success when actually given full-time responsibilities as teachers. This plan has proved most successful and is being extended for the school year 1937-38 with a small appropriation approved by Congress covering apprentice salaries.

DAY-SCHOOL AND PUBLIC-SCHOOL ATTENDANCE INCREASES**Hitherto Unschooled Children Enrolled**

The growing emphasis upon day-school attendance of Indian pupils has resulted in an increase of Indian day-school enrollment in Federal schools from 4,532 pupils in 1928 to almost 12,000 during the school year 1936-37. More than half of this increase represents children not previously enrolled in any school. During the same period of time Indian pupils in public schools have increased from 34,163 to 50,328.

The most spectacular development of the new day-school policy has been on the Navajo Reservation. Here there has been an increase of 37 new day schools during the last 2 years, with a resultant increase from 822 pupils in attendance at day schools to an enrollment of 2,147. Because of the tremendous number of Navajo children estimated not in any school at all, there has been no decrease in boarding-school enrollment during this period of time. There are still more than 7,000 Navajos of school age who are not enrolled in any kind of school.

INDIAN SERVICE HIGH SCHOOLS INCLUDE TRAINING FOR SELF-SUPPORT

There has been a continuing increase of Indian pupils enrolled in federally operated high schools. Many of these, because of the sparsity of population on some of the larger reservations, are and must continue to be boarding schools. On some of the smaller reservations or in areas where the population is more compact, these high schools are operated on a day basis.

The new Indian Service high schools are developing a program the major objective of which is to produce economically self-sustaining citizens. Recognizing that for many Indians their remaining lands constitute a major asset, these high schools are bending every effort to produce groups of young people who are not only interested in farming or stock raising, but who, through the course of their high-school careers, have engaged in farming under the supervision of the school on a practical self-supporting scale. This type of program has undergone gratifying development at the Chilocco School in Oklahoma on whose 8,000-acre campus the children are operating individual farms of 40 to 80 acres, caring for a substantial beef herd, raising chickens on a commercial scale, and otherwise experiencing the problems involved in making a living on a farm typical of that area.

The Fort Sill, Riverside, and Cheyenne and Arapaho Schools, also in Oklahoma, are being extended from elementary and junior high school into senior high schools and are offering a similar program of agricultural training. The Oglala Community High School at Pine Ridge in South Dakota is placing a great deal of emphasis on livestock training. It is operating a beef herd of over 600 head, engaging in the poultry business on a commercial scale, and operating a

hatchery for the furnishing of young stock to the local Indians. A similar program is being developed at the Rosebud Boarding School and plans of a similar nature are being developed for the Crow Creek, Cheyenne River, and Standing Rock Reservations. The principles underlying this type of development are being applied in varying degrees throughout the Indian schools.

REALISTIC TEXTBOOKS SOUGHT FOR INDIAN CHILDREN

One of the most serious problems of the Indian Service lies in dealing with races of people, large numbers of whom still speak their native languages and for whom English is a little-used foreign tongue. In many of these groups, as for instance the Navajo, the Pima and the Papago, written records are entirely foreign to the racial experience, and reading, therefore, lacks the functional reality which it occupies in the thinking of the average white child. Furthermore, on the more isolated reservations, Indian young people have no opportunity for contact with ferryboats and steamers, firemen, policemen, postmen, railroad trains and streetcars, and many other objects and people whose activities form the familiar basis of elementary school reading. The problem of teaching these young people to read, to make intelligent use of numbers, and in other ways to accept the basis of American education would be greatly simplified if textbook material existed which was phrased in terms of the Indian child's experiences. During the last year the Education Division has, therefore, accepted as one of its responsibilities the encouragement of the preparation of materials to be used in Indian schools. Some of this material will probably be published by the Government because of its exclusive application to limited areas in the Indian Service. In other cases, the Indian Service will encourage its commercial publication because it would appear to be valuable for use in white schools as well as Indian schools.

SPECIAL SCHOOLS

Recognizing the importance of health for a population which has suffered seriously from the inroads of disease introduced by the whites, the Education and Health Divisions are cooperating in the operation of several special schools. At Fort Apache in Arizona, at Chemawa, in Oregon, and at three of the boarding schools on the Navajo Reservation special trachoma programs are being operated, and the schools are devoted almost exclusively to children suffering from this disease. In several of the day-school areas on the Navajo Reservation, cooperation with the Health Division is making available the service of special physicians and nurses to operate trachoma clinics for children and parents.

At Fort Totten in North Dakota an old boarding school closed several years ago has been reopened as a tuberculosis preventorium, and a special regimen is in force calculated to strengthen these children against the greatest scourge of Indian life.

At the Eklutna Vocational School and at Wrangell Institute in Alaska where a Territorial tuberculosis survey indicates that almost 25 percent of the population is suffering from active tuberculosis, school children revealed to be suffering from the disease are being given segregated treatment in dormitory units of the two school plants, in the absence of adequate provision for hospitalization or for home treatment.

EDUCATIONAL LOANS

While much of the educational emphasis in Indian schools is on practical learning, leading toward economic self-sufficiency, the Government has been earnestly seeking competent Indian young people for advanced vocational and collegiate training. Under the Indian Reorganization Act several hundred thousand dollars have been appropriated for loans to Indians for higher education and at the present time 372 students are receiving Government aid, 146 of whom engaged in advanced vocational work. To meet the needs within the Indian Service for competent operators of tractors, graders and other road machinery and Diesel power plants, a special school for adults was opened at Phoenix Indian School last year. Its students were limited to men of promise, and all of its graduates were placed. Because of increased opportunities for practical experience on the Navajo Reservation, the school is this year being moved to Wingate. Haskell Institute also offers a program of advanced training for commercial students.

EDUCATION OF ALASKA NATIVES AND INDIANS

During the last year several significant changes have taken place in the organization of the native schools in Alaska, which are also under the jurisdiction of the Indian Service's Education Division.

Civil service standards strengthen personnel.—Until recently the civil service regulations have not applied to these schools. For the last year or two new appointments have been drawn from civil service registers and during the current year an attempt has been made to qualify through noncompetitive examination as many of the incumbent Alaska teachers as possible and to replace with civil service appointees members of the Alaska staff who fall far short of minimum civil service requirements. These steps should materially strengthen the Alaska personnel. New salary classifications recognizing the extremely isolated nature of many of the Alaska posts should make these positions somewhat more attractive than they have been in the past.

Quality of native crafts improves.—The interest aroused in the preservation and development of native arts and crafts has resulted in the initiation of several projects of adult craft activity which should ultimately be of great value to many of the natives of Alaska. The School at Nome has cooperated in adapting and restyling several of the native skin garments, with the result that 50 native women have been kept busy producing parkas and mukluks which have been absorbed by commercial traders as rapidly as produced. The success of this endeavor at Nome will be followed up in other northern areas and it is hoped that a material contribution to the cash economy of the Eskimos may result.

Efforts are being made to improve the quality of wood carving among the southeastern natives and ivory carving among the Eskimos of the north coast, both of which have deteriorated in the face of Japanese competition.

Demand for secondary education grows.—The same increased interest in secondary education that has been remarked on in connection with the Indians of the continental area is also becoming manifest in Alaska. Only two Federal centers of secondary education are now operated—Wrangell Institute and Eklutna Vocational School. The maximum enrollment at both of these institutions was reached during the current year and enrollments for the new year indicate a substantial increase which will tax present facilities. This increased interest is apparent among the Eskimos as well as the Alaska Indians, which indicates that consideration must be given shortly toward the establishment of a secondary school for Eskimos, keyed to their economic needs and located in the northern part of Alaska where climatic conditions and vocational opportunities will resemble those in their natural homes.

The Eklutna School, to which Eskimo secondary students are now sent, is located on Cook Inlet only a short distance from Matanuska Colony, in an area where climatic conditions are milder and considerably different than those encountered in their homes. There has been some evidence that this factor has not contributed to the most healthy conditions for many students from the northern areas.

The preliminary reports of the territorial tuberculosis survey indicate the presence of active tuberculosis upon the part of about 25 percent of the village populations. A slightly lower percentage was discovered in the boarding schools. Due to the totally inadequate provision for sanitarium care within the territory, the Education Division has been cooperating with the Health Division in providing rest care in segregated portions of the school dormitories for students in need of medical attention.

Two thousand native children without school facilities.—There are still approximately 2,000 natives not in any school. Some of these

are in areas remote from white contact into which no attempt has yet been made to penetrate. In several of these locations the Eskimos are requesting schools, and at Chandalar, just north of Fort Yukon, the natives themselves have furnished a primitive structure and paid a small salary to a teacher in order to inaugurate the educational work. The Service has furnished some equipment and supplies and hopes in the near future to be able to add this to its active schools. In other areas served only by territorial schools, full-bloods are excluded, and in some of these areas where the white population has disappeared, the Indian Service is taking over the operation of the school and admitting full-bloods as well as mixed-bloods.

School buildings need replacement.—Many of the original Alaska school buildings were built hastily and without a view to permanence. Some have long outlived their usefulness and others have been outgrown. The Government is, therefore, faced with a problem of replacing many of these structures with better insulated and more permanent buildings which provide more adequately for community needs.

Alaska reindeer become Indian Service responsibility.—With the close of the current year the supervision of the Alaska reindeer service has been transferred from the territorial government to the Office of Indian Affairs. In view of the fact that the direct supervision of herds and the business of the native cooperative stores has been handled by Federal teachers, the full responsibility for the reindeer service has been placed under the Education Division of the Indian Office.

The Alaska native—Alaska's greatest resource.—The exploitation of the mineral and animal resources of Alaska has not been without effect on the native people. The nicely balanced, though primitive, economy which enabled the Eskimo and the Alaska Indian to wrest a living from a country of climatic extremes, has been upset—upset not only physically, but, what is more tragic, psychologically. People, who before the coming of the white man were self-dependent, adjusting their activities to the seasonal rhythm of life, have been taught to depend on a cash economy. Instead of hunting and fishing for their own needs and growing gardens in areas where such effort is rewarded abundantly, the native has been encouraged to disregard these activities and work instead for wages, or trap for the white man and buy his food and clothing from the store. More and more a people which once was self-sufficient has become dependent upon external forces which are totally disregardful of their human needs. Alaska is coming to be thought of as an area capable of permanent and desirable economic development. This new permanency of Alaska will necessitate a redefinition of the native's position in Alaska life.

Although the fact has not always been recognized, the native Alaskan is one of the most important resources of the Territory.

The whites of Alaska cannot continue to profit at the expense of the natives. Constitutionally suited to life in the Arctic, the Eskimo and the Alaska Indian must form the foundation to any long-range planning for the development as contrasted to the exploitation of the Territory.

The Education Division of the Indian Office is being guided by these facts in undertaking to develop an educational program which will capitalize the native virtues and at the same time adapt the natives for necessary contacts with their white associates.

FOR BETTER HEALTH AMONG INDIANS

THROUGH ENLARGED PUBLIC HEALTH WORK, IMPROVEMENT OF HOSPITAL FACILITIES, RESEARCH

That Indian health has improved in recent years is borne out by the figures below showing the decline in the death rate between 1933 and 1936. The Indian death rate in 1936 was 13.7 per thousand, or 2.2 more per thousand than among whites (including Negroes). Only as recently as the 1920's the Indian death rate was double that of the general population. The Indian death rate is still too high. Tuberculosis and the infant death rate are the principal factors.

	1933	1936	Per 1,000 decrease as compared with 1933
Indian birth rate per 1,000 population.....	23.8	22.3	-1.5
Indian death rate per 1,000 population.....	15.5	13.7	-1.8

The Indian Service maintained a health staff of 1,625 workers¹ during the fiscal year 1937, and 4,139 hospital beds, in its effort to improve health among Indians. The increase in the health appropriation from \$4,011,620 to \$4,502,630 made possible much-needed improvements in equipment and personnel.

PUBLIC HEALTH PROGRAM SEEKS COOPERATION OF STATES, EXTENDS PREVENTIVE WORK

State cooperation increases scope of work.—The Health Division is expending its cooperative relationships with State and local health authorities. One notable example is the five-county full-time health district in Oklahoma. This was made possible through the cooperation of the State Board of Health, the Public Health Service, the Children's

¹ Health personnel at the close of the fiscal year included 10 administrative and supervisory physicians, a supervising dentist, 7 supervisory nurses, 150 whole-time and 87 part-time physicians, a special expert in tuberculosis, 3 special physicians for tuberculosis, 12 special physicians for trachoma, 19 consultants, 14 whole-time and 11 part-time dentists, 115 field nurses, 418 hospital nurses, 12 nurses at large working with special physicians, 6 assistant medical technicians, and 759 other employees, a total of 1,625. This represents an increase of about 150 over 1936, due in large part to the opening of new hospitals, with some additional employees to provide better service at existing plants.

Bureau, and the Indian Office. The Indian Office is supplying the services of three nurses. The population in this five-county area is 25 percent Indian.

The cooperative health work in North Carolina on the Cherokee Reservation has continued and the area has increased from a three-county to a five-county unit.

Contractual relationships have been established with the State of Minnesota for the further development of public health service for the benefit of Indians in the Arrowhead district of that State (the northeast tip of the State).

There has been a continuous increase in the number of senior physicians appointed deputy State health officers by State health departments, made possible by Executive order of May 1935. There has been a notable increase in this procedure in the Northwestern States.

Indian Service pioneers in tuberculosis vaccination.—The work of vaccination against tuberculosis under Dr. Joseph D. Aronson, special expert, was notable. During the fiscal year there were vaccinated against tuberculosis a total of 97 children at the Pima Agency, 232 at the Shoshone Agency, and 177 at the Turtle Mountain Agency. An equal number of controls are under observation. Plans were made during the year to extend this work on the Rosebud Agency and in the southeastern section of Alaska. The public health nursing program and the follow-up of these vaccinated children and the keeping of records has been strengthened.

The prevention of disease through immunizations and inoculations is evidenced by:

Vaccinations against smallpox.....	36, 625
Inoculations against diphtheria.....	8, 847
Immunizations against typhoid fever.....	10, 489

A few Indians were immunized against spotted fever.

"Trachoma schools" prove effective.—The continued operation of the Roosevelt Trachoma School on the Fort Apache Reservation, Ariz., brought significant results. The concentrated program of treatment of children in this school is demonstrating that it is possible actually to eliminate trachoma from the school child by this means. It has been predicted that after one more year of intensive treatments trachoma will be practically arrested among the school children on the Fort Apache Reservation.

HOSPITAL CONSTRUCTION MAKES IMPROVED SERVICE POSSIBLE

The hospitals which were reported under construction at the end of 1936 were completed during 1937 and are now available for use, making a total of 93 hospitals and sanatoria, exclusive of infirmaries

of less than 10 beds, with a total capacity of 4,139 beds, 131 cribs, and 280 bassinets. Included in this group are 15 sanatoria with a capacity of 1,300 beds, some of which are also available for general medical and surgical cases. The increase in number of beds available over 1936 was nearly 400.

The following hospital and sanatoria projects are under construction and will add approximately the number of beds indicated when completed:

	<i>Beds</i>
Fort Defiance Hospital and laboratory, Arizona.....	140
Wishiah Sanatorium, California, unit for Indians.....	30
Choctaw-Chickasaw Sanatorium, Talihina, Okla. (replacement and enlargement).....	150
Tahlequah Hospital, Oklahoma.....	75
Sioux Sanatorium, Rapid City, S. Dak.....	150

Hospital treatments increase.—In hospitals there were treated 52,222 patients for general conditions other than tuberculosis and in the various sanatoria 2,334 patients were treated for tuberculosis. Out-patient treatments numbering 428,207, and 1,311,291 hospital treatments were given. The number of maternity cases treated in hospitals was 3,857, in contrast with 3,301 last year. The yearly increase of obstetrical service in Indian hospitals is significant of the attitude of Indians toward modern medicine. There were 13,445 Indians treated for trachoma.

Pneumothorax operations for tuberculosis.—In the tuberculosis field, emphasis has been placed on the treatment of selected cases by collapse therapy or pneumothorax. One doctor has been operating on the Blackfeet Reservation and another in the vicinity of San Xavier and on the Sells Agency. Two additional physicians on educational leave went to the Phipps Institute in Philadelphia for this type of training. One was sent to the Pine Ridge Reservation and the other detailed to Dr. Aronson in connection with the tuberculosis vaccination campaign.

Dental service aided by use of trailers.—Dental treatment was given to 30,886 Indians and 64,630 treatments were given. This service consisted mostly of work among the school children in an effort to preserve teeth in that age-group; however, dental treatments were furnished adults in emergencies and to relieve pain. The three dental trailers in operation have been of immense help in the covering of large territories.

NURSING WORK EXPANDS, TURNOVER, DUE TO HEAVY DEMANDS ON NURSES, HANDICAPS WORK

The nursing work of the Indian Service has increased in amount and in scope during the year 1937.

Specialized training for nurses improves service.—In the field of public health nursing the research work in tuberculosis control has

opened several positions demanding nurses trained to collect epidemiological data and carry on educational activities of an intensive nature. The nurses detailed to this work were willing to take special instructions at their own expense (nurses do not have educational leave) at Phipps Institute.

In the field of trachoma control, nurses have been given special instruction at the Fort Apache Trachoma School. A public health nurse has been established at the Navajo Agency to do an intensive follow-up of day-school and community trachoma patients. Several nurses have taken leave without pay to get instruction at Dr. Gradle's trachoma clinic in southern Illinois.

Hospital nursing standards evaluated.—A study was made by the National Organization of Nursing Education in cooperation with the nursing section looking toward an evaluation of the nursing service being rendered at one or two hospitals in the Oklahoma district. Certain of these techniques of study are now being used in our supervisory work throughout the service.

The building of new hospitals has been the occasion for certain standards of organization to be laid down. One chief nurse has been responsible for opening hospitals, so that a similarity of organization is being brought about.

High turn-over continues—Superwomen needed.—The nursing service still suffers from inadequate numbers. The overhead costs in personnel are extremely difficult to absorb in units of 50 beds and below. The nurse in charge is responsible for nursing, for food preparation and purchase, for typing the records, for giving anesthetics, for supervising the cleaning, for issuing drugs, and delivering babies in the absence of the physician. These superwomen are difficult to find, and, when found and employed, their tempers get worn down. Changes of scene, matrimony, and physical breakdowns are the most frequent reasons for labor turn-over.

More than 50 percent of the nurses have been in the service less than 2 years. This undesirable rate of turn-over will continue until better hours of work and better quality of performance are made possible. Nurses of the best caliber do not find either professional or personal satisfaction in trying to nurse 20 to 40 patients for a 12-hour stretch.

There are 52 Indian girls taking training in schools of nursing with the help of educational loan funds. There will be places for all of them in the Indian Service on the successful completion of their training.

Civil service has been unable to furnish adequate lists of eligibles for either public health or hospital vacancies. The plan has been to try to fill the vacancies in isolated places either by transfer or by probationary appointment, rather than offering appointment in the centers where temporary nurses are usually available.

Nurse-aid training continues.—The training of Indian nurse aids has continued this year. Members of the first class have made successful adjustments in their work. Twenty-three were admitted, 20 graduated, and 17 were placed in the various hospitals of the service. There is a problem in continuing to absorb the supply of trained nurse aids without displacing older personnel who have not had training.

Supervisory nurse for each district needed.—The year 1938 promises further opportunity for improvement in the quality of work being done if each medical district is furnished with a supervisory nurse. This should give better data on the causes of turn-over and prevent many of the misunderstandings and breakdowns.

RESEARCH AIDS IN FIGHT AGAINST TRACHOMA AND OTHER DISEASES PREVALENT IN INDIAN COUNTRY

Dr. Phillips Thygeson, of Columbia University, continued his research work in the pathology and prevention of trachoma at the Roosevelt School, Fort Apache, Ariz. The first year of this study seemed to indicate that trachoma was due to a filterable virus. This, the second year, was devoted to the growing of live epithelial tissue in the laboratory according to the Rockefeller technique. The project succeeded. Next year the work will continue in an endeavor to grow the trachoma virus on the growing epithelial tissue in an effort to develop an antitoxin.

Columbia University also continued its research work, made possible through the support of the Indian Office, in the study of dental caries and nutrition among the tribes on the Lower Kuskokwim River in Alaska. The dietaries of native groups were carefully studied by weight and variety per individual and samples sent to the laboratory at Columbia University, New York, for analysis, as well as the examination of body excretions from groups showing dental caries and those with no dental caries.

Yale University, through Dr. John R. Paul, has made a study of cardiac rheumatism among various tribes in the western section of the United States. It was found that among 688 children in the northern tribes, the rate of rheumatic heart disease was 45 per thousand. Among 1,106 in the middle-western section the rate was 19 per thousand. while among 1,019 children in the southwestern section the rate was only 5 per thousand.

In connection with the Public Health Service, studies were continued among the Pueblos in New Mexico to determine the incidence of amebic dysentery. It was shown that among 1,024 Indians examined in seven localities in New Mexico the rate of amebic dysentery ranged from 40.2 percent to 14.1 percent. The general rate was about 20 percent. This is high. In connection with these studies,

the cause and the source of this infection and its ultimate prevention are being and will be investigated.

Negotiations were consummated with Harvard University for a study of venereal disease among the Cherokee Indians in North Carolina. This study, without expense to the Indian Office, proposes to obtain a clearer concept of the ratio of venereal disease in racial groups.

ALASKA MEDICAL SERVICE

Toward the end of the fiscal year, Dr. J. G. Townsend, Director of Health, in company with Mr. D. E. Thomas, Chief of the Alaska Section of the Indian Office, Dr. J. F. van Ackeren, Director of the Alaska Medical Service, and Mr. Claude M. Hirst, Director of Education in Alaska, made an intensive trip through the Territory, visiting all of the hospitals with the exception of that at Unalaska. The trip was of great value in making an evaluation of the Alaska health problem and afforded an opportunity for conferences between the health and educational representatives toward the furtherance of better service.

For the nearly 30,000 Indians, Eskimos and Aleuts of Alaska, scattered over an area one-fifth the size of the United States, the following medical workers are provided: 1 director, 1 dental supervisor, 1 supervisor of nurses, 7 full-time physicians, 6 part-time physicians, 27 field nurses, 18 hospital nurses, and in addition, a considerable number of minor employees, most of whom are natives. Dental service is furnished by local dentists under contract on a fee basis.

Tuberculosis death rate is more than ten times the white.—The great and overpowering problem among Alaskan natives is tuberculosis, the death rate from which ranges from 600 to 800 per hundred thousand, according to locality. (This is in comparison with only 50 per hundred thousand among the white population.) Little can be done to correct this tragic situation until more hospitals can be built.

New hospitals to be built.—In July 1936 the Office of Indian Affairs took over the operation of the hospital at Point Barrow, which had been previously operated by the Presbyterian Mission Board. In February 1937 fire broke out in the hospital and it was burned to the ground, together with a considerable portion of the supplies. Since then the medical work has been carried on under a severe handicap. However, an appropriation of \$100,000 was included by Congress in the Second Deficiency Act for the construction of a hospital at Point Barrow, and plans are now under way.

Representatives of the Construction Division of the Office of Indian Affairs visited Alaska during the spring to make a study of locations for the new schools and hospitals for which an appropriation

was made, and one member of the group went to Point Barrow. It is hoped that this hospital will be completed within the next 2 years.

The Interior Department Appropriation Act for 1938 carries funds for the construction of a modern hospital at Bethel, on the Kuskokwim River. This hospital has been urgently needed for many years. A full-time physician for this area is being added to the staff, and the position of part-time physician is being discontinued.

Cooperation with Territorial officials sought.—The medical director of Alaska is working in very close liaison with the Territorial health authorities, and a closer alliance between the Indian Office and the Alaska Health Department is developing.

Serving an area hitherto without help.—The first health service to natives living to the eastward of Point Barrow was inaugurated this year. A public health nurse of considerable Alaskan experience packed two sleds with a 30-day food supply and made the trek to Demarcation Point. The story of her experience brings fresh realization of the desperate need for medical service, the eagerness of the Eskimo for reliable help and the tremendous difficulty of rendering even the most simple type of medical service in that vast area of cold.

INDIAN CLAIMS MAKE CREEPING PROGRESS

Across two administrations, Congress has been informed that Indian tribal claims will not be settled for another hundred years by present methods, and that in the majority of cases, after jurisdictional acts have been passed, no settlement whatever is secured—no justice done. In 15 years, with suits pending which have set forth claims in excess of a billion dollars, the actual moneys collected by Indian tribes have been in the neighborhood of \$6,000,000, while as stated, the majority of the suits brought have been wholly abortive, due to defects in the jurisdictional acts authorizing them.

The costs to the Government are extravagant, and the political and moral reactions upon the Indians are demoralizing.

The Indian Claims Commission Bill proposes a conservative forward step. It passed the Senate in 1937, but was lost in the House during the past session of Congress.

There follows a summary of the work of the Indian Office during 1937 in the laborious task of settling Indian claims.

Reports were made during the year to the Department of Justice and the United States Court of Claims on 16 tribal claims suits. Approximately 80 tribal claims suits are now pending in the United States Court of Claims and the Supreme Court of the United States. Six cases were dismissed with decisions adverse to the Indians. The Seminole Nation of Oklahoma recovered a judgment of \$10,099.25 in the Court of Claims.

Reports have been prepared and sent to the committees of Congress on over 30 bills relating to Indian tribal claims against the United States; 1 report on a depredation claim; 3 reports on attorney fee claims; and 6 reports on enrollment and individual Indian claims.

SHOSHONE AND KLAMATH SUITS SET IMPORTANT PRECEDENTS

In the suits of the Shoshone Indians of the Wind River Reservation in Wyoming and the Klamath Tribe of Oregon, decisions of more than ordinary importance to Indians were handed down by the Court of Claims, dealing with the fundamental question of the nature and extent of the tribal title to treaty reservations. Counsel for the United States, relying upon the decision of the Supreme Court in the case of the *United States v. Cook* (19 Wall. 591), had contended that the Indian tribal title is analogous to that of a life tenant, embracing only the right of the members of a tribe to live on the reservation, and to use such materials as might be necessary for building and farming purposes; and that the Indians are not entitled to compensation for the value of the land, as such, or for the timber and mineral content of the land. In rejecting this contention, the Court of Claims held that the title of the Indian tribe includes, as beneficial incidents, the net value of the land, including the net value of any timber and minerals within the boundaries of the reservation. The court further held that the power of the Government to hold and manage the property and affairs of the Indians in good faith for their betterment and welfare does not extend so far as to enable the Government to give their lands to others and to appropriate them to its own purposes. The Shoshone Indians were awarded a net judgment of \$4,408,444.23, and the Klamath Tribe of Oregon was awarded a judgment of \$5,313,347.42. In view of the important question and the large amounts involved, these cases probably will be carried to the Supreme Court of the United States.

PERSONNEL ADMINISTRATION

Personnel administration in the Indian Service is, as is undoubtedly true of all other agencies, one of the most important functions. Due to the extreme diversity of problems and activities handled by this Service, its requirements for adequately trained persons are representative of nearly every activity that is being carried on under the Federal Government.

In every phase of the work, persons with the ability to handle human-relation problems in addition to their specialties are needed. For example, an Indian Service forester must not only be skilled in timber work, he must be able to work with, direct, and train Indians of differing individual temperaments and cultural backgrounds. Likewise, doctors, nurses, extension agents, and other workers in spe-

cialized fields must be skilled not only in their particular professions, but must be experts in dealing with problems of human relations.

One of the most acute problems of personnel administration facing the Indian Service is that of recruiting adequately trained administrators. In another section of this report reference is made to a plan looking toward the selection and training of persons for eventual employment in administrative positions.

Ultimately the successful recruitment and training of persons for administrative positions will require modification of present civil-service methods of selection. At the present time, civil-service examinations make no provision for the elimination of candidates who are not suited to Indian Service work because of prejudices, or inability to work in isolated communities and under conditions as they exist on many of the reservations. Likewise, present civil-service examinations do not differentiate between successful and merely acceptable performance. In situations where the success or failure of an employee hinges so much on his or her ability to handle tactfully and judiciously all kinds of practical situations, depending almost exclusively on a gift in the field of human relations, it is essential that these important factors be given considerable weight. Some progress has been made along this line. The Civil Service Commission has to some extent recognized the specialized problems that exist in the Indian Service and has announced certain examinations for the sole purpose of filling positions in the Indian Service, such as those for teachers and nurses. More thought and effort is needed, however, before these examinations will result in securing persons with the desired training and experience.

There is an all but universal demand by the various field units for additional personnel. Very little increase has been provided during the last several years in the regular personnel available for carrying on of the work of the Indian Service. The large emergency programs that have been carried on, many of which have been completed, have created additional problems for the regular agency staffs, and have demanded that a careful analysis be made of methods of procedure so as to insure the maximum of work with a minimum of effort. Even where such studies have been completed, and where all possible duplication of effort has been eliminated, the regular personnel hardly are able to handle adequately the volume of business required of them.

In carrying out the announced policy of the administration to place Indians, wherever available and qualified, in regular positions in the Indian Service, notable increases in Indian employment have been effected. Some of the offices at the present time have 100 percent Indian staffs. The number of Indians employed in the Washington office has increased during the past 3 years from 10 percent of the total staff to about 35 percent. Indians have been placed in many

of the important posts, including those of regional coordinator, superintendent, education field agent, and chief clerk.

EMPLOYMENT OF INDIANS

An employment service is maintained for the placement of Indians in positions both within and without the Service. During the fiscal year, employment was obtained for some 6,570 Indians, 2,654 of whom were placed within the Indian Service, and 3,916 with private employers. Two-thirds of those placed outside of the Indian Service went into permanent positions. The type of situations in which Indians have been placed has varied from highly technical assignments to household work. Many Indians have been placed in industrial positions, and satisfactory employment opportunities have presented themselves to Indians who have graduated from Indian Service trade schools. The follow-up work with Indians who have been placed outside the Service indicates that for the most part they have been able to adapt themselves satisfactorily to urban industrial life.

As far as possible, Indians are encouraged to remain on their homelands and to use their training in working out their individual economic problems and the economic rehabilitation of their tribes. But whenever an Indian indicates a desire to secure employment off the reservation, all possible aid is extended to him in securing work for which he or she is fitted by training and experience.

STEPS TOWARD IMPROVEMENT OF INDIAN OFFICE ADMINISTRATION

The Indian Service is one of the largest bureaus in the Federal Government, with peculiarly complex duties, and jurisdiction over many different kinds of property in many States. Indian self-government eventually should simplify the problem of Indian administration. For the present, however, the processes of education and the extension of powers to tribal groups are throwing additional tasks upon Indian Service workers. To simplify and to improve the coordination of this complicated and scattered organization is no easy task; however, gradual improvements are being made.

DECENTRALIZATION OF AUTHORITY

Responsibility has been shifting to field units of the Service and to Indian groups, in the attempt to lessen the number of decisions that must be made in Washington. In Oklahoma and Kansas, a regional coordinator acts as a unifying force over the supervisory personnel in the entire area. He also, although without administrative authority over the superintendents, acts as a clearing agent for jurisdictional matters, and serves to bind together the various jurisdictional activities in these relatively homogeneous areas. A similar plan is

being tried out in the Lake States. An area coordinator, stationed at Minneapolis, has advisory status with regard to all Indian Service activities in the States of Minnesota, Wisconsin, and Michigan.

A different plan is being tried out in the Southwest. There, in the large Navajo and Pueblo areas, no coordinator has been set up, but the superintendents in the two jurisdictions have been so provided with technical personnel that their jurisdictions are virtually self-contained.

A recent step forward in the direction of efficient organization has been the creation of uniform supervisory districts. Each technical division of the Indian Service is interested in its own particular field of activity; some of the divisions are more particularly interested in a definition of territory broken down along economic lines; others, more concerned with a definition along State lines. And with each technical division provided with a different number of employees on its field staff, no two divisional field districts coincided. There were numerous headquarters, and coordination was extremely difficult. After considerable study, a system of 10 districts was worked out: District one's headquarters, with supervision over agencies east of the Mississippi, is the Washington Office; the area west of the Mississippi including also Wisconsin and Michigan, has been divided into eight districts; and Alaska has been designated as the tenth district. Under this system, a supervisor of health activities, for example, will be brought into the same headquarters with the supervisor of education or forestry or extension. All supervisors in the same headquarters will be interested in approximately the same Indian jurisdictions, and a coordination of effort and an exchange of experience will be promoted.

IMPROVEMENT IN MAIL AND FILES SYSTEM

The complexity of Indian Office administration is reflected nowhere so clearly as in the office's mail and file system. There are stored records dating back to pre-Revolutionary days. The files had not been reclassified since 1907. Many of the old records were still in letter-book or folder form.

Approximately a year and a half ago a revision of the mail and files system was undertaken, and the mail and files system is already showing the results of the overhauling. The registration of incoming mail had dwindled down to about 20 percent. Today, 80 percent of the incoming mail is being briefed or carded.

ACCUMULATION OF RELIABLE STATISTICS AS BASIS FOR SOUND PLANNING

Progress in Indian Service administration is not possible without systematic planning and program-making.

A prerequisite to sound planning is the accumulation of basic facts—facts about Indians and their resources must be ascertained.

Cooperative studies go beyond enumeration of acreage and population, classification of soil types, and irrigable areas. They go into the psychological background of the people themselves, so that any plans now made will be based upon not only physical facts but upon a sound anthropological basis.

An office planning group has been established, which has begun to collect and correlate all available information about certain reservations. The planning group in particular has undertaken a study of the agencies in the Lakes States area. The outcome of all these efforts, it is believed, will be plans and programs which will serve as a stable background for consistent developments in Indian administration.

The central personnel unit has been reorganized to the end that certain groups of the personnel shall be responsible for the handling of all the personnel matters for certain groups of reservations. Further development along these lines is contemplated and will, if possible, be accomplished during the coming year.

IN-SERVICE TRAINING PROGRAMS

In-service training, which seeks to improve the usefulness and opportunities of those already in the Service, is being given in various forms. The summer school institutes for teachers have already been described (see p. 227), as have also, briefly, the courses being offered to Indian enrollees in E. C. W. camps during their leisure time.

In the Navajo-Pueblo area, the foundations have been laid for an experiment in recruitment and in-service training for administrative positions. The "internes", selected by personal interview from the graduating or graduate groups in universities, will be placed in varied situations of increasing responsibility. A director of training will oversee their educational experiences and maintain records of their achievement; but administratively they will be held fully responsible to the agency giving them their experience. Indian Service and Soil Conservation Service will supply the most important of the experiences and testing assignments. To advise in the conduct of this experiment and others which may follow, the Secretaries of Agriculture and Interior have appointed an interdepartmental committee of Washington office representatives, and the Civil Service Commission has designated a representative to sit upon this committee.

In the interest of smoother administration, groups of Chief Clerks have been called into Washington to take part in a series of explanations and discussion of regulations, business procedure, and common reservation problems.

CODIFICATION OF DATA NEEDED

In the field of organization and administration are two problems which are pressing for attention. Approximately 3 years ago a codification of Indian Service regulations was undertaken. Due to a shortage of personnel, the work of codification has had to be set aside for the time being, and the Office has not yet been able to take up the task and carry it to completion. This should be done; the sooner the better.

PROBATE WORK IS EXPEDITED

Procedure for the determination of heirs of Indians and for probate of Indian wills has been simplified and made uniform by the probate division.

The master docket, instituted in 1934, is proving invaluable. A complete record of each case is kept, immediately available, and up-to-date.

The work of the probate division in conducting courses of instruction on the proper execution of wills among all Federal employees doing this type of work is now beginning to bear fruit; also the present practice of examining all wills during the lifetime of the testator and correcting errors in description and ambiguous or prohibited devises is eliminating contests and applications for rehearing. The present practice of notifying all interested parties of decisions made by the Secretary of the Interior, and the provision of opportunity for hearings in the event of dissatisfaction, is apparently most satisfactory to Indians. Misunderstandings both as to the law and the facts are immediately explained, with the result that nearly all cases are closed satisfactorily after the first hearing. The docket shows that during the current year the applications for rehearing had dwindled to 2.8 percent, and that after explanations and review, the rehearings were less than 1 percent.

Records show that during the fiscal year 1937 the probate division disposed of cases as indicated:

General probate of wills and determination of heirs	1, 712
Five Civilized Tribes cases	297
Osage cases, wills, fees, etc	70
Total	2, 079

A study is now being made of the law and the practice relating to inherited interests in estates that, through division among numerous heirs, have become practically valueless and yet entail enormous expense in management. Some progress has been made, and it is hoped that plans may be worked out whereby such lands can be made useful to their Indian owners.

INDIAN SERVICE APPROPRIATIONS

Treasury Appropriations

Object	1932	1933	1934	1935	1936	1937	1938
General purposes.....	\$2,587,285.73	\$1,840,054.35	\$1,593,500.00	\$1,806,804	\$2,780,880	\$3,343,401.05	\$3,150,441.85
Industrial assistance.....	1,005,000.00	1,301,000.00	1,233,881.67	1,000,510	3,710,400	2,288,470.00	1,932,500.00
Irrigation and water development.....	497,601.00	457,824.00	599,614.00	7,430,665	1,321,652	1,149,664.00	1,293,998.00
Education.....	10,185,400.00	9,771,000.00	9,103,230.00	7,990,565	8,795,120	9,395,375.00	10,048,525.00
Conservation of health.....	3,658,000.00	3,508,800.00	3,281,800.00	3,264,595	3,849,620	4,422,360.00	4,965,690.00
Support of Indians.....	2,216,300.00	2,156,300.00	2,141,900.00	2,141,815	2,279,350	2,425,000.00	2,770,100.00
Miscellaneous (roads, annuities, etc.).....	40,020.00	31,020.00	31,020.00	42,020	771,020	736,020.00	761,020.00
Subtotals.....	20,789,605.73	19,065,998.35	17,984,945.67	16,757,064	23,538,132	23,760,290.05	24,922,274.85
Construction (general).....	5,570,440.00	1,654,100.00	711,600.00	490,000	981,000	780,900.00	4,291,775.00
Roads and bridges.....	670,000.00	1,420,000.00	270,000.00	2,000,000	4,000,000	3,500,000.00	3,000,000.00
Total.....	27,030,046.73	22,140,098.35	18,966,545.67	19,157,064	28,519,132	28,041,190.05	32,214,049.85

SPECIFIC APPROPRIATIONS FROM TRIBAL FUNDS MADE TO SUPPLEMENT FOREGOING TREASURY APPROPRIATIONS

General purposes.....	\$332,913.98	\$126,300.00	\$390,501.00	\$100,000	\$9,153	\$20,000.00	\$159,815.00
Industrial assistance.....	180,532.21	45,000.00	188,000.00	35,000	151,000	381,000.00	91,600.00
Irrigation and water development.....	49,500.00	59,000.00	46,950.00	6,720	6,500	7,000.00	5,000.00
Education.....	910,000.00	803,000.00	708,600.00	599,550	389,580	332,820.00	314,995.00
Conservation of health.....	125,000.00	125,000.00	131,550.00	121,490	102,000	80,000.00	-----
Support of Indians.....	1,767,100.00	1,032,380.00	789,100.00	564,155	781,700	768,400.00	788,180.00
Miscellaneous (roads, annuities, etc.).....	50,000.00	25,000.00	25,000.00	-----	-----	105,000.00	105,000.00
Total.....	3,415,046.19	2,215,680.00	2,279,701.00	1,426,915	1,499,933	1,694,220.00	1,464,590.00
Grand total.....	30,445,092.92	24,355,778.35	21,246,246.67	20,583,979	30,019,065	29,735,410.05	33,678,639.85

PROBLEMS NOT MET OR INCOMPLETELY MET

The Indian Service has failed to deal, so far, with several urgent problems. Some of these unmet problems are set forth below.

THE ALLOTTED LAND SITUATION

This situation necessarily gets worse each year, with the passage of more and more allotted land into the heirship status and into the more complicated phases of heirship. There are cases of expenditure by the Federal Government on heirship lands totaling seventy times the value of the lands in question, and still, under existing law, destined to go on running. There are cases of allotments which have more than a hundred heirs entitled to various shares, and whose total annual rental of, say, \$40, is divided into the heirs' respective varying shares of cents and fractions of cents, and credited to the heirs on the agency books.

The original draft of the Wheeler-Howard bill would have supplied the corrective for this disastrous Indian land situation. As Congress did not grant that power to the Department, the Indian Service can only proceed by a creeping operation of remedies which scarcely will keep pace with the advance of the disease.

THE ARCHAIC APPROPRIATION SYSTEM FOR INDIANS

The Indian Service appropriation is perhaps the most voluminous and heterogeneous known in the Government. The dead hand of the past rests upon hundreds of frozen appropriations. The Service falls short of practicable economies and it uses moneys in places of lesser need, while places of intenser need go without, as a result of the frozen appropriation system.

WHAT TO DO ABOUT LIQUOR AMONG INDIANS

Technically, the Indian Service adheres to an all-embracing plan of universal prohibition among Indians. Practically, with the funds allowed by Congress, prohibition is being enforced only in limited areas. Shall the Service abandon prohibition entirely? Shall it work toward a break-down of Indian country into areas where enforcement is still imperative, and other areas where costs and frictions probably must continue to exceed the results? Can local tribal option be established unconditionally, under a statute authorizing the introduction solely of light wines and beers under a system of government monopoly and with a permit system?

In Alaska there prevails the opposite condition from that of the United States. There, no local prohibition exists, and there the conditions are even worse than they are known to be in any of the areas within the United States where enforcement of prohibition is imperfect.

ADEQUATE APPROPRIATIONS FOR INDIAN ECONOMIC DEVELOPMENT

The evaporation of Indian economic resources went forward at unchecked or accelerated speed for more than a lifetime; then, beginning in 1934, a reversal of the process has been secured—on paper. Whether, quantitatively speaking, the downward economic trend can be really reversed depends partly upon getting a solution of the allotted lands problem mentioned above; partly upon the help of the Budget and of congressional appropriations committees in permitting the shift of frozen appropriations out of unproductive into economically productive uses; but partly also upon getting a more generous allowance for land purchases and for agricultural credit than has yet been secured.

Connected with the immediately above-mentioned problems is another which should cause the Indian Service more concern than it does. This reference has to do with the practice established long ago of rendering Indians either no service or universally free services; not only free schools but universally free medicine; not only free medicine but free real-estate administration; and so on.

The problem of putting some part of Indian Service work upon at least a partially self-supporting basis is one that must be faced.

APPENDIX**INDIAN POPULATION**

Indian population as reported by Indian agencies has been increasing about 1.2 percent per annum during the last 7 years. Although the data upon which this figure is based comprise only about two-thirds of all Indians in the United States according to the United States Bureau of the Census, and contain certain discrepancies which are explained below, it is believed that they are sufficiently accurate and representative to serve as a basis for measuring the currently normal growth of Indian population.

The statistics which follow on Indian population are contained in tables 1 and 2. The data in table 1 (a and b) which give a total of 332,397 Indians in the United States were obtained from the 1930 decennial enumeration of the United States Bureau of the Census. The data in table 2 (a and b) which are taken from the records kept at the Indian agencies and reservations of enrolled Indians on January 1, 1937, show a total of 241,499 Indians. To this last figure should be added 95,867 persons of Indian blood who have certain rights under the Indian Reorganization Act of June 18, 1934, or by various other acts or treaties have come under the supervision of the Office of Indian Affairs; thus making a total of 337,366.

Several reasons may be assigned for the lack of agreement between the two sets of figures for total number of Indians in the United States. The first concerns the definition of an Indian. One of the major

difficulties in seeking data on Indians in the United States is the lack of a statutory definition as to what constitutes an Indian. When the fifteenth decennial census was taken in 1930 by the Bureau of the Census, enumerators were instructed to record as Indians those of mixed blood "except where the percentage of Indian blood is very small", or where he was "regarded as a white person in the community where he lives." The degree of blood was reported as either full or mixed. An Indian, as defined by the Office of Indian Affairs on the other hand, is any person of Indian blood, regardless of degree, who through wardship, treaty or inheritance has acquired certain rights.

A second reason for the discrepancy lies in the fact that the data in table 2-b, which were obtained by the Office of Indian Affairs from the superintendents of Indian agencies, include only those persons of Indian blood whose names appear on their rolls. Among this number about 84.5 percent live on the jurisdiction where enrolled and 2½ percent on other Indian jurisdictions. The 13 percent residing elsewhere in the United States, and the 2½ percent now living at reservations other than where enrolled, are recorded in this table as in the States in which their respective jurisdictions are located, because it has been found impracticable to allocate them to the States in which they may be residing, especially as the addresses of many of them are unknown.

Further inaccuracies in these census rolls of Indian agencies are due to the inability of some superintendents to obtain immediate, or indeed any, notification of births and deaths occurring in their respective jurisdictions. Absentee Indians also frequently fail to report births and deaths to their jurisdiction headquarters. In order to bring up to date and otherwise correct these census rolls, superintendents have attempted at various times to make house-to-house canvasses, but as lack of funds prohibits such enumerations except at very infrequent intervals, the census rolls at the Indian agencies are altered from year to year primarily upon the basis of reported births and deaths.

Table 2-a contains a summary for the last 8 years of Indian population enrolled at Indian agencies by place of residence. The last column of this table may be particularly interesting for it reveals the percent of total enrolled Indians living elsewhere than on reservations. In 1930, it will be noted, 14.6 percent so resided, while in 1934 it had dropped to 12.4 percent. By January 1, 1937, a slight increase to 12.9 percent is revealed. This may perhaps be attributed to better times, just as the reverse movement from 1930 to 1934 may be due to the depression. Although the data do not cover a sufficiently long period to serve as a basis for definite conclusions there is reason to believe that there is a tendency for Indians to return to their reservations during hard times, and to leave, seeking other opportunities, when economic conditions improve.

According to the United States Bureau of the Census, Oklahoma in 1930 contained 92,725, or 27.9 percent of all Indians in the United States, and more than any other State. Arizona followed Oklahoma with 43,726 or 13.2 percent of the total, and New Mexico was third with 28,941 or 8.7 percent. In 1930 these three States contained practically half of the entire Indian population of the United States.

On January 1, 1937, over 60 percent of the total Indian population enrolled at Indian agencies was full-blood. In Arizona, Florida, Iowa, Mississippi, and New Mexico practically the entire enrolled Indian population is full-blood, while in Colorado, Nevada, and Utah over 80 percent is full-blood. The full-blood population ranged between 40 and 50 percent of the total number in 7 of the 22 States which contain Indian agencies. Of these 22 States, Minnesota has the smallest percentage of enrolled full-blood Indians. Arizona has more full-blood enrolled Indians than any other State, followed by New Mexico. These two States together contain 54 percent of all the enrolled full-blood Indians in the entire United States. Only 7 percent of the total enrolled population at all Indian agencies is less than one-fourth degree Indian blood.

The most important tribes numerically enrolled at Indian agencies are the Navajo, numbering 44,304, Sioux, including the Assiniboin, 35,857, and the Chippewa, 26,457; while in 1930 the same tribes numbered 40,863, 33,168 and 23,647, respectively. The increase from April 1, 1930, to January 1, 1937, for the Navajo tribe was 3,441 or 8.4 percent, for the Chippewa tribe 2,810 or 11.9 percent, and the Sioux, including the Assiniboin, 2,689 or 8.1 percent.

The Indians under the supervision of the Office of Indian Affairs whose names do not appear on the census rolls at Indian agencies and who are estimated to total 95,867, are listed below as follows:

California (special roll made pursuant to the Court of Claims act of May 18, 1928, less those enrolled at Indian agencies reported in table 2)-----	14, 835
Michigan, under the Reorganization Act of June 18, 1934-----	2, 262
New York, 1932 estimate-----	4, 523
Oklahoma (Five Civilized Tribes, Bureau of the Census, 1930)-----	72, 626
Cherokee-----	40, 904
Chickasaw-----	4, 685
Choctaw-----	16, 641
Creek-----	8, 607
Seminole-----	1, 789
Texas, under the Reorganization Act of June 18, 1934-----	300
Washington (Taholah Agency), unattached Indians largely of Cowlitz tribe, 1936 estimate-----	500
Wisconsin:	
Rice Lake Bands of Chippewa, special census, July 1930-----	221
Stockbridge tribe, under Reorganization Act of June 18, 1934-----	600

The supervision of the education and medical relief of the natives of Alaska was transferred to the Office of Indian Affairs on March 16, 1931. Of Alaska's total population of 59,278, according to the last

census enumeration of the United States Bureau of the Census taken as of October 1, 1929, 29,983 or 50.6 percent were recorded as Indians. Of the latter, 19,028 were Eskimaun, leaving 10,955 of other linguistic stocks.

TABLE 1-A.—Indian Population by Age, 1930

Age	Total	Male	Female	Age	Total	Male	Female
All Ages	332,397	170,350	162,047	25 to 29 years.....	23,491	12,127	11,364
Under 5 years.....	46,680	23,447	23,233	30 to 34 years.....	19,309	10,032	9,277
Under 1 year.....	9,296	4,681	4,615	35 to 44 years.....	33,031	17,285	15,746
5 to 9 years.....	46,736	23,434	23,302	45 to 54 years.....	25,039	13,403	11,636
10 to 14 years.....	39,456	20,028	19,428	55 to 64 years.....	16,787	9,173	7,609
15 to 19 years.....	36,219	18,154	18,065	65 to 74 years.....	10,030	5,257	4,773
20 to 24 years.....	28,843	14,697	14,146	75 and over.....	6,327	3,079	3,248
				Unknown.....	449	229	220

Source: Bureau of the Census, Department of Commerce.

TABLE 1-B.—Indian Population by State and Sex, 1930

State	Population			State	Population		
	Total	Male	Female		Total	Male	Female
Total	332,397	170,350	162,047	Montana.....	14,798	7,664	7,134
Alabama.....	465	228	237	Nebraska.....	3,256	1,674	1,582
Arizona.....	43,726	22,471	21,255	Nevada.....	4,871	2,456	2,415
Arkansas.....	408	210	198	New Hampshire.....	64	33	31
California.....	19,212	10,018	9,194	New Jersey.....	213	123	90
Colorado.....	1,395	748	647	New Mexico.....	28,941	14,864	14,077
Connecticut.....	162	90	72	New York.....	6,973	3,584	3,389
Delaware.....	5	3	2	North Carolina.....	16,579	8,353	8,226
District of Columbia.....	40	17	23	North Dakota.....	8,387	4,293	4,094
Florida.....	581	299	288	Ohio.....	435	252	183
Georgia.....	43	26	17	Oklahoma.....	92,725	46,744	45,981
Idaho.....	3,638	1,833	1,805	Oregon.....	4,776	2,442	2,334
Illinois.....	469	250	219	Pennsylvania.....	523	305	218
Indiana.....	285	158	127	Rhode Island.....	318	154	164
Iowa.....	660	349	311	South Carolina.....	959	474	485
Kansas.....	2,454	1,333	1,121	South Dakota.....	21,833	11,172	10,661
Kentucky.....	22	16	6	Tennessee.....	161	85	76
Louisiana.....	1,536	800	736	Texas.....	1,001	516	485
Maine.....	1,012	518	494	Utah.....	2,869	1,516	1,353
Maryland.....	50	34	16	Vermont.....	36	20	16
Massachusetts.....	874	458	416	Virginia.....	779	436	343
Michigan.....	7,080	3,835	3,245	Washington.....	11,253	5,778	5,475
Minnesota.....	11,077	5,691	5,386	West Virginia.....	18	15	3
Mississippi.....	1,458	743	715	Wisconsin.....	11,548	5,951	5,597
Missouri.....	578	336	242	Wyoming.....	1,845	982	863

Source: Bureau of the Census, Department of Commerce.

TABLE 2-A.—Indian Population Enrolled at Federal Agencies by Place of Residence 1930 to 1937, inclusive

Year ¹	Total population	Residing on reservations			Residing elsewhere	Percent	
		Total	At jurisdiction where enrolled	At another jurisdiction		Residing on reservations	Residing elsewhere
1930.....	221,808	189,361	185,377	3,984	32,447	85.4	14.6
1931.....	225,544	193,213	189,162	4,051	32,331	85.7	14.3
1932.....	228,381	199,140	194,391	4,749	29,241	87.2	12.8
1933.....	231,754	202,865	197,852	5,013	28,889	87.5	12.5
1934.....	234,792	205,759	200,744	5,015	29,033	87.6	12.4
1935.....	235,270	205,920	200,767	5,153	29,350	87.5	12.5
1936.....	238,283	208,794	203,554	5,240	29,489	87.6	12.4
1937.....	241,499	210,338	204,943	5,395	31,161	87.1	12.9

¹ From 1930 to 1934, inclusive, as of Apr. 1; from 1935 to 1937, inclusive, as of Jan. 1.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Arizona												
Total enumerated Indian population 1	241,499	122,802	118,697	204,943	104,978	99,965	5,395	2,628	2,767	31,161	15,196	15,965
Colorado River Agency, see California	45,633	23,503	22,150	43,813	22,578	21,235				1,510	767	743
Cocopah Reservation (Cocopah)	1,213	661	552	759	417	342	330	158	172	1,416	222	194
Colorado River Reservation	41	24	17	33	21	12	3	1	2	5	2	3
Chemehuevi	775	412	363	638	341	297	16	11	5	121	60	61
Mojave	309	148	161	217	104	113				92	44	48
Other tribes	459	260	199	420	236	184	14	10	4	25	14	11
Fort Mojave Reservation (Mojave)	7	4	3	1	1							2
Fort Apache Agency and Reservation (Apache)	397	225	172	88	55	33	19	10	9	290	160	130
Hopi Agency and Reservation (Hopi)	2,781	1,470	1,311	2,742	1,432	1,290	12	6	6	27	12	15
Navajo Agency, see New Mexico and Utah (Navajo) 2	3,248	1,689	1,559	3,166	1,539	1,516	10	4	6	72	35	37
Paiute Agency, in Utah, and Kaibab Reservation (Paiute)	21,988	11,305	10,683	21,945	11,253	10,662	27	15	12	16	7	9
Phoenix School Jurisdiction and Camp Verde Reservation (Apache)	85	51	34	80	48	32	2	2		3	1	2
Pima Agency	417	231	186	162	89	73	51	32	19	204	110	94
Fort McDowell Reservation (Mojave-Apache)	6,109	3,114	2,995	5,554	3,002	2,832	146	51	95	109	61	48
Gila River Reservation	194	105	88	169	93	76	8	4	4	17	9	8
Maricopa	4,651	2,364	2,287	4,496	2,291	2,205	72	28	44	83	45	38
Pima	339	156	183	335	155	180	3			1		
Other tribes	4,164	2,130	2,034	4,021	2,063	1,958	64	25	39	79	42	37
Maricopa Reservation (Papago)	176	78	70	140	73	67	5	3	2	3	2	1
Salt River Reservation	1,088	550	538	1,013	524	489	66	19	47	9	7	2
Other tribes	980	494	486	919	473	446	52	14	38	9	7	2
Pima	108	56	52	94	51	43	14	5	9			
San Carlos Agency, and Reservation (Apache)												
Sells Agency	2,966	1,507	1,459	2,869	1,450	1,419	30	19	11	67	38	29
Gila Bend Reservation (Papago)	6,184	3,127	3,057	5,709	2,907	2,802	5	2	3	470	218	252
Papago Reservation	112	65	47	96	56	40				16	9	7
Papago	5,556	2,800	2,756	5,116	2,595	2,521				440	205	235
Other tribes	5,501	2,767	2,734	5,081	2,577	2,504				420	190	230
Pima	26	11	15	20	8	12				6	3	3
Other tribes	29	15	10	15	10	5				14	12	2
San Xavier Reservation (Papago)	516	262	254	497	256	241	5	2	3	14	4	10
Tucson Canon Agency												
Havasupai Reservation (Havasupai)	662	345	314	527	280	247	9	5	4	126	63	63
Hualapai Reservation (Walapai)	208	121	87	206	119	87	1	1		1	1	
	454	227	227	321	161	160	8	4		125	62	63

California ³											
Carson Agency, in Nevada⁴											
Fort Independence Reservation	8,707	4,432	4,275	6,919	3,605	3,314	76	33	43	1,712	794
Paiute	1,393	687	706	1,289	646	643				41	918
Shoshone	73	40	33	73	40	33					63
Paiute	69	38	31	69	38	31					
Shoshone	4	2	2	4	2	2					
Inyo County	886	423	463	784	382	402				102	41
Paiute	739	348	391	654	315	339				85	33
Shoshone	142	73	69	127	65	62				15	8
Other tribes	5	2	3	3	2	1				2	2
Mono County	434	224	210	432	224	208				2	2
Maidu	3			3	3						
Paiute	362	182	180	361	182	179				1	1
Shoshone	15	6	9	15	6	9					
Washoe	54	33	21	53	33	20				1	1
Colorado River Agency, in Arizona and Fort Yuma Reservation (Yuma)											
Hopwa Valley Agency	848	440	408	745	385	360	5	4	1	98	51
Hopwa Valley Reservation	1,946	959	987	1,497	752	745	9	5	4	440	202
Hoopa	1,549	754	795	1,278	632	646	9	5	4	145	117
Klamath	575	302	273	506	269	237	9	5	4	202	28
Rancheria	974	452	522	772	363	409				60	32
Bear River (Bear River)	397	205	192	219	120	99				202	89
Blue Lake (Blue Lake)	23	13	10	19	11	8				178	85
Crescent City (Smith River)	66	34	32	41	17	24				4	2
Eel River (Miami)	130	78	72	83	47	36				25	17
Smith River (Smith River)	112	61	51	76	45	31				46	19
Mission Agency	2,956	1,560	1,396	2,048	1,141	907	10	4	6	36	31
Augustine Reservation (Mission)	14	9	5	11	6	5				67	36
Cabazon Reservation (Mission)	27	17	10	22	12	10	1	1	1	42	21
Cahuilla Reservation (Mission)	106	52	54	63	31	32	1			14	10
Campo Reservation (Mission)	133	67	66	118	56	62	1	1		13	3
Capitan Grande Reservation (Mission)	168	86	82	155	83	72				2	2
Cuyapaipe Reservation (Mission)	3	1	2	3	1	1				2	2
Inio Reservation (Mission)	33	17	16	31	15	16					
Laguna Reservation (Mission)	5	2	3	5	2	3					
La Jolla Reservation (Mission)	232	127	105	133	83	50	1		1	98	44
La Posta Reservation (Mission)	3	1	2	2	1	1				15	7
Los Coyotes Reservation (Mission)	86	51	35	71	41	27				9	2
Manzanilla Reservation (Mission)	66	28	38	57	26	31				73	37
Mesa Grande Reservation (Mission)	227	127	100	153	90	63	1		1	3	3
Mission Creek Reservation (Mission)	21	11	7	14	7	7				7	3
Morongo Reservation (Mission)	289	159	140	179	110	69				120	49
Pala Reservation (Mission)	210	113	97	139	81	38	1	1		70	31
Palm Springs Reservation (Mission)	49	25	24	48	25	23				23	11
Palm Springs Reservation (Mission)	67	35	32	44	24	20				118	54
Pechanga Reservation (Mission)	221	112	109	103	58	45				86	43
Pineau Reservation (Mission)	185	102	83	97	58	39	2	1	1	15	7
San Manuel Reservation (Mission)	43	22	21	28	15	13					
San Pascual Reservation (Mission)	9	4	5	9	4	5				24	15
Santa Rosa Reservation (Mission)	50	30	20	26	15	11					

See footnotes at end of table.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
California—Continued.												
Mission Agency—Continued.												
Santa Ynez Reservation (Mission)	86	39	47	19	11	8				67	28	39
Santa Ysabel Reservation (Mission)	249	130	119	198	110	88				51	20	31
Soboba Reservation (Mission)	127	62	65	107	57	50				20	10	1
Sycuan Reservation (Mission)	38	17	21	37	17	20				1		1
Torres-Martinez Reservation (Mission)	199	115	84	178	105	73				19	10	9
Sacramento Agency³.	1,564	786	778	1,340	681	659				172	85	87
Fort Bidwell Reservation	129	76	53	94	54	40				24	16	8
Paute	127	76	51	94	54	40				22	16	6
Other tribes	2		2							2		2
Modoc County other than Fort Bidwell Reservation	416	204	212	280	141	139				136	63	73
Pit River	308	152	156	266	134	132				42	18	24
Other tribes	108	52	56	14	7	7				94	45	49
Round Valley Reservation ⁴	829	409	420	802	398	404				9	4	5
Tule River Reservation ⁵	190	97	93	164	88	76				23	16	7
Colorado.	843	430	413	813	416	397				3	2	1
Consolidated Ute Agency, see Utah.	843	430	413	813	416	397				9	7	2
Southern Ute Reservation (Ute)	392	206	186	367	195	172				12	6	4
Ute Mountain Reservation (Ute)	451	224	227	446	221	225				2	3	2
Florida: Seminole Agency and Reservation (Seminole)	586	290	296	586	290	296				3	3	3
Idaho.	4,297	2,087	2,210	3,565	1,771	1,794				446	212	234
Coeur d'Alene Agency, see Washington.	2,132	1,015	1,117	1,753	824	929				64	269	125
Coeur d'Alene Reservation (Coeur d'Alene)	608	286	322	427	201	226				21	100	76
Kootenai Reservation (Kootenai)	118	59	59	104	53	51				14	6	8
Nez Perce Reservation (Nez Perce)	1,426	670	756	1,222	570	652				95	43	52
Fort Hall Agency and Reservation, see Utah.	1,853	962	891	1,628	846	782				177	87	90
Bannock	134	171	133	267	134	133				7	13	31
Shoshone	1,504	789	715	1,355	711	644				33	21	12
Other tribes	7	2	5	6	1	5				1	1	1
Western Shoshone Agency and Reservation, in Nevada	292	110	92	184	101	83				18	11	7
Paute	127	73	54	110	65	45				17	8	9
Shoshone	75	37	38	74	36	38				1		
Iowa: Sac and Fox Sanatorium Jurisdiction and Reservation (Sac and Fox of the Mississippi)	441	213	228	394	193	201				29	9	20
Potawatomi Agency⁶.	1,471	748	723	969	502	467				62	30	32
Kickapoo Reservation (Kickapoo)	332	167	165	224	124	124				15	8	7
Potawatomi Reservation (Potawatomi)	1,013	524	489	666	333	313				47	22	25
Sac and Fox Reservation (Sac and Fox of the Missouri)	126	57	69	55	25	30				24	10	14

	70	72	135	67	68	1	1	21	6	2	4
Michigan: Great Lakes Agency, scattered bands (Potawatomi) ^{3,7}	15,721	7,890	7,831	5,554	5,537	437	296	221	3,903	1,830	2,073
Minnesota	13,066	6,549	9,292	4,767	4,529	392	194	198	3,412	1,590	1,822
Consolidated Chippewa Agency	633	315	348	292	255	2	1	1	219	107	112
Boise Forte or Nett Lake Reservation (Chippewa)	536	277	489	259	230	14	8	6	33	10	23
Cass Lake and Winnibigoshish Reservations (Chippewa)	1,306	683	739	395	344	13	5	8	554	283	271
Fond du Lac Reservation (Chippewa)	370	158	212	126	147				97	32	65
Grand Portage Reservation (Chippewa)	931	478	823	426	397	51	23	28	57	29	28
Leech Lake Reservation (Chippewa)	8,342	4,453	5,702	2,919	2,783	310	154	154	2,330	1,067	1,263
White Earth Reservation (Chippewa)	580	307	501	269	232	2	1	1	77	37	40
Purchased Lands or Mille Lac Reservation (Chippewa)	368	187	323	162	161				45	25	20
Pipestone School Jurisdiction and Purchased Lands (Sioux)	561	283	165	89	76	1		1	395	194	201
Red Lake Agency and Reservation (Chippewa)	2,064	1,060	1,934	1,002	932	34	12	22	96	46	50
Mississippi: Choctaw Agency and Purchased Lands (Choctaw)	1,908	962	1,898	959	939	10	3	7	1,783	822	961
Montana	16,085	8,199	7,886	7,139	6,704	459	238	221	1,558	269	289
Blackfoot Agency and Reservation	4,261	2,186	2,075	1,896	1,764	43	21	22	546	267	279
Blackfeet.....	4,212	2,183	2,059	1,865	1,758	43			12	2	10
Other tribes.....	19	3	7	1	6						
Crow Agency and Reservation (Crow)	2,173	1,106	1,930	1,004	926	34	10	34	209	92	117
Flathead Agency and Reservation (Flathead)	3,085	1,518	2,412	1,256	1,156	107	61	46	566	250	316
Fort Belknap Agency and Reservation	1,487	761	1,347	689	638	29	20	9	111	52	59
Assinboin.....	678	347	528	320	308	13	8	5	40	22	18
Gros Ventre.....	809	414	719	369	350	16	12	4	71	30	41
Fort Peck Agency and Reservation	2,796	1,396	1,400	1,212	1,183	149	70	79	252	114	138
Assinboin.....	1,554	781	1,325	676	649	79	39	40	150	66	84
Sioux.....	1,242	615	1,070	536	534	70	31	39	102	48	54
Rocky Boy's Agency and Reservation	718	377	695	315	290	46	28	18	67	34	33
Chippewa.....	481	248	390	200	190	37	20	17	54	28	26
Cree.....	190	95	177	86	91	8	7	1	5	2	3
Other tribes.....	47	34	38	29	9	1			8	4	4
Tongue River Agency and Reservation	1,565	806	1,494	767	727	51	28	33	20	11	9
Cheyenne.....	1,561	802	1,490	763	727	51	28	23	20	11	9
Other tribes.....	4										
Nebraska ⁸	5,100	2,664	3,530	1,824	1,706	394	204	190	1,176	636	540
Potawatomi Agency, in Kansas, and Iowa Reservation	515	277	238	152	135	26	15	11	202	110	92
Winnebago Agency	4,585	2,387	3,243	1,672	1,571	368	189	179	974	526	448
Omaha Reservation (Omaha)	1,684	888	796	734	681	35	20	15	254	134	100
Ponca Reservation (Ponca)	397	191	206	197	100	13	4	9	187	90	97
Santee Reservation (Sioux)	1,292	676	736	378	358	218	108	110	338	190	148
Winnebago Reservation (Winnebago)	1,212	632	580	895	463	102	57	45	215	112	103
Nevada	5,381	2,672	5,050	2,513	2,537	268	131	137	63	28	35
Carson School Jurisdiction, see California ⁴	4,652	2,298	4,415	2,191	2,224	193	87	106	44	20	24
Fallon Reservation.....	129	116	240	127	113	1	1		4	1	3
Paute.....	161	71	159	89	70	1	1		1	1	1
Shoshone.....	84	45	81	38	43				3		2

See footnotes at end of table.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Nevada—Continued.												
Carson School Jurisdiction, see California—Continued.												
Fort McDermitt Reservation (Paiute).....	252	124	128	229	113	116	18	8	10	5	3	2
Pyramid Lake Reservation.....	549	281	268	276	276	265	5	3	2	3	2	1
Paiute.....	535	274	261	527	269	258	5	3	2	3	2	1
Other tribes.....	14	7	7	14	7	7						
Summit Lake Reservation (Paiute).....	53	25	28	42	21	21	3	2	1	8	2	6
Walker River Reservation.....	505	261	244	492	254	238	12	7	5	1		1
Paiute.....	424	214	210	411	207	204	12	7	5	1		1
Shoshone.....	81	47	34	81	47	34						
Nonreservation Paiute Area, Nevada.....	1,008	473	535	972	459	513	33	12	21	3	2	1
Paiute.....	870	406	464	846	398	448	22	7	15	2	1	1
Shoshone.....	51	23	28	43	20	23	8	3	5			
Washoe.....	82	40	42	79	38	41	2	1	1	1	1	
Other tribes.....	5	4	1	4	3	1	1	1				
Nonreservation Shoshone Area, Northeastern Nevada.....	847	401	446	769	363	406	76	37	39	2	1	1
Paiute.....	17	10	7	17	10	7						
Shoshone.....	830	391	439	752	353	399	76	37	39	2	1	1
Nonreservation Shoshone Area, Southern Nevada.....	601	291	310	587	283	304	9	6	3	5	2	3
Cherokee.....	2	2		2	2							
Paiute.....	146	66	80	137	60	77	9	6	3			
Pueblo.....	9	5	4	9	5	4						
Shoshone.....	444	218	226	439	216	223	4					
Nonreservation Washoe Area.....	592	313	279	543	295	248	36	11	25	13	7	6
Paiute.....	66	39	27	66	39	27						
Washoe.....	493	256	237	444	238	206	36	11	25	13	7	6
Other tribes.....	33	18	15	33	18	15						
Paiute Agency, in Utah.	194	94	100	182	89	93				12	5	7
Noapa River Reservation (Paiute).....	157	78	79	148	74	74				9	4	5
Las Vegas Tract (Paiute).....	37	16	21	34	15	19				3	1	2
Western Shoshone Agency and Reservation, see Idaho.	535	280	255	453	233	220	75	44	31	7	3	4
Shoshone.....	447	229	218	386	196	190	59	32	27	2	1	1
Other tribes.....	88	51	37	67	37	30	16	12	4	5	2	3
New Mexico.	35,515	18,284	17,231	35,031	18,021	17,010	64	27	37	420	236	184
Jicarilla Agency and Reservation (Apache).....	714	363	351	701	355	346	9	5	4	4	3	1
Mescalero Agency and Reservation (Apache).....	752	365	387	739	354	385	4	3	1	9	6	1
Navajo Agency, in Arizona (Navajo).....	22,010	11,155	10,855	22,005	11,132	10,853	3	2	1	2	1	1
United Pueblos Agency.....	12,039	6,401	5,638	11,586	6,160	5,426	48	17	31	405	224	181
Acoma Pueblo (Pueblo).....	1,137	577	560	1,115	563	552				22	14	8
Cocaniti Pueblo (Pueblo).....	307	163	144	295	156	139				12	7	9

Isleta Pueblo (Pueblo)	1, 137	614	523	1, 116	601	515	21	13	8
Jemez Pueblo (Pueblo)	648	336	312	648	336	312			
Laguna Pueblo (Pueblo)	2, 332	1, 216	1, 116	2, 043	1, 072	971	6	21	124
Nambe Pueblo (Pueblo)	141	67	74	131	62	69		10	5
Picuris Pueblo (Pueblo)	97	46	51	43	43	48		3	3
Pojoaque Pueblo (Pueblo)	20	10	10	20	10	10			
Sandia Pueblo (Pueblo)	125	63	62	125	63	62			
San Felipe Pueblo (Pueblo)	623	340	283	623	340	283			
San Ildefonso Pueblo (Pueblo)	131	67	64	130	66	64		1	
San Juan Pueblo (Pueblo)	550	277	273	523	258	265	3	19	5
Santa Ana Pueblo (Pueblo)	251	149	102	251	149	102			
Santa Clara Pueblo (Pueblo)	433	221	212	393	202	191	4	7	14
Santo Domingo Pueblo (Pueblo)	923	537	386	916	532	384		15	14
Sia Pueblo (Pueblo)	208	114	94	206	112	94		2	2
Taos Pueblo (Pueblo)	763	380	383	755	379	376		8	7
Tesque Pueblo (Pueblo)	133	70	63	133	70	63			
Zuni Pueblo (Pueblo)	2, 080	1, 154	926	2, 072	1, 146	926	2	6	
North Carolina: Cherokee Agency and Reservation (Eastern Cherokee)	3, 327	1, 749	1, 578	2, 282	1, 207	1, 075	6	1, 038	502
North Dakota	11, 002	5, 577	5, 425	7, 323	3, 740	3, 583	90	94	1, 745
Fort Berthold Agency and Reservation	1, 692	827	865	1, 619	788	831	9	3	31
Arikara	616	296	320	579	281	298	1	2	20
Gros Ventre	731	357	374	707	343	363	3	1	9
Mandan	345	174	171	333	164	169	5	7	2
Fort Totten Agency and Devils Lake Reservation (Sioux)	1, 022	512	510	993	471	462	22	42	23
Sisseton Agency and Lake Traverse or Sisseton Reservation, in South Dakota (Sioux)	46	28	18	46	28	18			
Standing Rock Agency and Reservation									
Turtle Mountain Agency and Reservation (Chippewa)	1, 729	866	863	1, 578	783	785	25	99	51
Oklahoma	6, 513	3, 344	3, 169	3, 147	1, 660	1, 487	34	39	1, 630
Cheyenne and Arapaho Agency and Reservation (Cheyenne and Arapaho)	23, 565	11, 974	11, 891	17, 562	8, 848	8, 714	365	343	2, 761
Kiowa Agency	2, 836	1, 479	1, 357	2, 522	1, 307	1, 245	72	61	100
Kiowa Reservation	4, 816	2, 341	2, 475	4, 768	2, 318	2, 450	7	7	81
Apache	340	178	162	338	177	161	5	6	19
Comanche	2, 213	1, 079	1, 134	2, 194	1, 071	1, 123	1	1	1
Kiowa	2, 263	1, 084	1, 179	2, 236	1, 070	1, 166	2	2	9
Wichita Reservation	1, 492	736	766	1, 485	722	763	4	4	9
Caddo	967	479	488	962	476	486	1	2	2
Delaware	140	63	77	140	63	77			
Wichita	385	184	201	383	183	200	1		
Osage Agency and Reservation (Osage)	3, 649	1, 857	1, 782	2, 007	1, 046	961	6	2	805
Pawnee Agency	3, 106	1, 578	1, 528	2, 471	1, 270	1, 201	99	96	829
Kaw Reservation (Kaw)	515	268	247	516	256	244	21	23	209
Oakland Reservation (Tonkawa)	51	27	24	39	21	18	3	1	84
Otoe Reservation (Otoe)	756	391	365	582	301	281	4	8	3
Pawnee Reservation (Pawnee)	959	483	476	779	408	371	36	34	104
Ponca Reservation (Ponca)	825	409	416	775	384	391	44	25	56
							19	13	80
							20	17	12

See footnotes at end of table.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—Continued

State, jurisdiction, reservation, and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Oklahoma—Continued.												
Quapaw Agency.												
Eastern Shawnee Reservation (Shawnee).....	3,430	1,681	1,749	1,755	865	860	308	156	152	1,397	660	737
Miami Reservation (Miami) ¹⁰	280	131	149	167	81	85	26	14	12	87	33	54
Ottawa Reservation (Ottawa).....	287	143	144	126	66	60	2	2		139	75	84
Peoria Reservation (Peoria) ¹⁰	422	222	200	228	120	108	11	7		183	95	88
Quapaw Reservation (Quapaw).....	370	173	197	175	82	93	37	20	17	158	71	87
Seneca Reservation (Seneca).....	556	266	290	326	154	172	17	10	7	213	102	111
Wandot Reservation (Wandot).....	732	363	369	400	200	205	144	71	73	183	92	91
Wandot Reservation (Wandot).....	732	363	369	400	200	205	144	71	73	183	92	91
Wandot Reservation (Wandot).....	732	363	369	400	200	205	144	71	73	183	92	91
Shawnee Agency.												
Iowa Reservation (Iowa).....	4,536	2,312	2,224	2,584	1,320	1,264	50	25	25	1,902	967	935
Kickapoo Reservation (Kickapoo).....	112	53	59	111	53	58				1		1
Potawatomi Reservation (Potawatomi).....	260	137	123	249	131	118				11		5
Sac and Fox Reservation (Sac and Fox).....	2,607	1,353	1,314	894	418	446	17	7	10	1,756	898	858
Shawnee Reservation (Shawnee).....	861	432	429	740	378	362	15	7	8	106	47	59
Oregon.												
Klamath Agency and Reservation.												
Klamath.....	4,720	2,310	2,410	3,655	1,826	1,799	308	155	153	787	329	458
Modoc.....	1,412	687	725	1,094	553	541	51	28	23	267	106	161
Palute.....	329	155	174	243	114	129	7	4	3	161	61	100
Pit River.....	143	71	72	114	57	57	17	10	7	59	27	32
Shasta.....	110	55	55	82	45	37				12	4	8
Salem School Jurisdiction.												
Grande Ronde Reservation.....	1,165	606	559	908	482	426	35	22	13	222	102	120
Clackamas.....	362	192	170	251	139	112	19	12	7	92	41	51
Rogue River.....	81	38	43	49	27	22	9	5	4	23	6	17
Umpqua.....	63	28	35	45	28	18				12	6	6
Other tribes.....	160	92	68	111	65	46	10	7	3	18	9	9
Siletz Reservation.												
Chastacosta.....	471	240	231	361	183	178	8	3	5	39	20	19
Galice Creek.....	30	13	17	25	12	13				102	54	48
Joshua.....	42	23	19	38	20	18				5	1	4
Klamath.....	45	24	21	15	9	6	1	1		4	3	1
Meguenodon.....	60	35	25	47	26	21				29	14	15
Rogue River.....	55	27	28	40	17	23				13	9	4
Tutuni.....	46	26	20	39	21	18	1	1		15	10	5
Other tribes.....	41	16	25	38	21	23				3	1	2
	152	76	76	119	63	56	6	1	5	27	12	15

Fourth Section Allottees (Public Domain)									
Cherokee	174	158	296	160	136	8	7	1	28
Klamath	18	6	12	12	6				
Kus	55	29	46	22	24	3	3		6
Rogue River	25	30	52	23	29	1	1		2
Tuoutai	74	34	70	39	31		1		1
Umpqua	18	7	11	4	3				11
Other tribes	43	18	37	21	16	3	3		3
Umatilla Agency and Reservation	69	30	66	39	27	1			2
Cayuse	1,345	707	915	450	465	170	86	84	260
Payute	370	203	308	144	164	40	18	5	5
Umatilla	73	30	43	27	34	12	3	9	22
Walla Walla	124	47	77	101	62	15	6	9	8
Other tribes	631	311	320	176	155	71	41	30	229
Warm Springs Agency and Reservation	147	83	64	50	32	14	18	14	1
Payute	798	329	419	341	367	52	19	33	38
Tenino (Warm Springs)	71	34	60	30	30	7	3	4	4
Other tribes	460	207	253	192	232	22	9	8	13
Wasco	227	118	109	108	95	11	3	8	7
Other tribes	40	20	21	10	12	1	4	8	5
South Dakota	27,733	14,204	23,728	12,272	11,456	1,142	532	600	2,863
Cheyenne River Agency and Reservation (Sioux)	3,477	1,805	2,895	1,518	1,377	254	152	132	298
Crow Creek Agency	1,572	786	1,274	651	623	151	54	97	147
Crow Creek Reservation (Sioux)	963	467	831	411	420	68	19	49	64
Lower Brule Reservation (Sioux)	609	319	443	240	203	83	35	48	83
Flandreau School Jurisdiction and Purchased Lands (Sioux)	350	190	176	101	75	40	22	18	134
Pine Ridge Agency and Reservation (Sioux)	8,703	4,434	7,812	4,019	3,793	180	84	96	711
Rosebud Agency	5,698	4,465	4,233	4,036	3,765	233	115	138	644
Rosebud Reservation (Sioux)	6,650	3,437	6,312	3,258	3,054	81	39	42	257
Yankton Reservation (Sioux)	2,048	1,025	1,489	778	711	172	76	96	387
Sisseton Agency and Lake Traverse or Sisseton Reservation, see North Dakota (Sioux)	2,761	1,422	1,930	1,022	908	136	63	73	695
Standing Rock Agency and Reservation, in North Dakota (Sioux)	2,172	1,102	1,840	925	915	98	52	46	234
Utah	2,151	1,111	2,041	1,056	955	39	24	15	71
Consolidated Ute Agency, in Colorado, and Public Domain Allotments (Ute)	43	25	43	25	18				
Fort Hall Agency, in Idaho, and Washakie Sub-Agency (Shoshone)	132	61	118	55	63	10	6	4	4
Navajo Agency, in Arizona	310	162	310	162	148				
Navajo	305	159	306	147	147				
Payute	4	3	4	3	1				
Payute Agency, see Arizona and Nevada	389	201	365	188	177	3	1	2	21
Goshute Reservation (Goshute)	154	79	146	72	74	1	1		7
Kanosh Reservation	26	12	23	10	13				3
Payute	5	2	5	2	3				2
Ute	21	10	18	8	10				3
Koonsharem Reservation (Ute)	27	13	26	13	13				1
Payute Reservation (Payute)	19	12	13	9	4				6
Shirwis Reservation (Payute)	91	46	86	45	41	1		1	4

See footnotes at end of table.

TABLE 2-b.—Indian Population in Continental United States Enumerated at Federal Agencies, According to Tribe, Sex, and Residence, Jan. 1, 1937—

Continued

State, jurisdiction, reservation and tribe	Indian population			Residing at jurisdiction where enrolled			Residing at another jurisdiction			Residing elsewhere		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Utah —Continued.												
Paute Agency, see Arizona and Nevada —Continued.												
Skull Valley Reservation (Goshute)	37	19	18	36	19	17	1					
Gandy (Homestead) (Paute)	6	4	2		4							
Cedar City (church property) (Paute)	29	16	13	29		13						
Utah and Ouray Agency and Reservation (Ute)												
Washington ³	1,277	662	615	1,205	626	579	26	17	9	46	19	27
	13,098	6,487	6,611	9,402	4,700	4,702	199	78	121	3,497	1,769	1,728
Coeur d'Alene Agency, in Idaho, and Kalispel Reservation (Kalispel)												
Colville Agency	97	50	47	85	46	39	12	4	8			
Colville Reservation (Colville)	4,068	2,036	2,032	3,410	1,746	1,664	103	39	64	555	251	304
Spokane Reservation (Spokane)	3,221	1,631	1,590	2,798	1,436	1,362	73	28	45	350	167	183
Taholah Agency ³	847	405	442	612	310	302	30	11	19	205	84	121
Chelan Reservation (Chelan)	2,502	1,213	1,229	1,472	773	699	23	13	10	1,007	487	520
Makah Reservation (Makah)	26	20	6	17	15	2						
Nisqually Reservation (Nisqually)	407	224	183	341	192	149	3		3	63	32	31
Ozette Reservation (Ozette)	62	38	24	53	34	19				9	5	4
Quinalt Reservation	1	1		1	1					4	4	5
Chelalis	1,766	874	892	865	430	435	14	11	3	887	433	454
Quileute	105	51	54	61	23	38				44	28	16
Quinalt	284	143	141	263	132	131	1	1		20	10	10
Upper Chinook	1,228	616	612	529	267	262	12	9	3	687	340	347
Other tribes	124	51	73	4	4		1	1		119	46	73
Skokomish Reservation	23	13	12	8						17	9	8
Clallam	208	101	107	175	91	84	5	1	4	28	9	19
Skokomish	2	1	1				2	1				
Squaxin Island Reservation (Squaxin)	206	100	106	175	91	84	3	1	3	28	9	19
Tulalip Agency	32	15	17	20	10	10	1	1		11	4	7
Lummi Reservation (Lummi)	3,498	1,742	1,756	2,034	1,004	1,030	15	5	10	1,449	733	716
Muckleshoot Reservation (Muckleshoot)	661	337	324	544	277	267				117	60	57
Port Madison Reservation (Squamish)	194	89	105	182	82	100	1		1	11	7	4
Puyallup Reservation (Puyallup)	168	84	84	152	79	73	3		3	13	5	8
Swinomish Reservation (Swinomish)	322	155	167	30	13	17				292	142	150
Tulalip Reservation and Tulalip unattached Indians (Snohomish)	285	125	150	275	130	145				10	5	5
Public Domain (Clallam)	667	315	352	467	220	247	5	1	4	195	94	101
Public Domain (Nooksak)	762	396	366	3	1	2				739	395	364
Public Domain (Skagit)	239	125	114	221	115	106	2	2		36	8	8
Public Domain (Skagit)	200	106	94	160	87	73				17	17	19
Yakima Agency and Reservation (Yakima)												
Washington ³	2,933	1,547	1,386	2,401	1,131	1,270	46	17	29	486	238	248
	11,532	5,788	5,744	8,939	4,532	4,407	428	196	232	2,165	1,060	1,105
Wisconsin												
Great Lakes Agency ⁷	4,614	2,313	2,301	3,248	1,621	1,627	118	69	49	1,248	623	625

Had River Reservation (Chippewa).....	1, 191	615	576	663	346	317	25	15	10	503	254
Lac Courte Oreille Reservation (Chippewa).....	1, 623	790	833	1, 328	651	677	38	19	19	257	120
Lac du Flambeau Reservation (Chippewa).....	1, 871	413	458	672	319	353	5	2	3	194	92
Red Cliff Reservation (Chippewa).....	618	327	291	287	147	140	47	31	16	284	149
Scattered bands (Potawatomi).....	311	168	143	298	158	140	3	2	1	10	8
Keshena Agency and Menominee Reservation (Menominee).....	2, 221	1, 129	1, 092	2, 120	1, 058	1, 032	19	5	14	82	36
Tomah School Jurisdiction.....	4, 697	2, 346	2, 351	3, 571	1, 748	1, 748	291	122	169	835	401
Oneida Reservation (Oneida).....	3, 241	1, 629	1, 612	2, 333	1, 210	1, 123	160	66	94	748	353
Public Domain Allotments (Winnebago).....	1, 456	717	739	1, 238	613	625	131	56	75	87	48
Wyoming.....	2, 311	1, 158	1, 153	2, 104	1, 065	1, 039	43	21	22	164	72
Shoshone Agency and Wind River or Shoshone Reservation.....	2, 311	1, 158	1, 153	2, 104	1, 065	1, 039	43	21	22	164	72
Arapaho.....	1, 164	594	570	1, 124	574	550	14	8	6	26	12
Shoshone.....	1, 147	564	583	980	491	489	29	13	16	138	60
											78

¹ See estimated statement of other Indians not enumerated, numbering 95,867. The Miami and Peoria Reservations, Quapaw Agency, with a total Indian population of 657 formerly reported in estimated statement in the text preceding tables, now included in table 2.

² Includes Jan. 1, 1936, population for the Navajo tribe which was formerly under the Hopi Jurisdiction.

³ See estimated statement on page — for population not enumerated.

⁴ A house-to-house canvass was made by the Carson Agency, Nevada, and many Indians reported as residing in California last year are now reported in Nevada.

⁵ Not available by tribe.

⁶ Iowa Reservation reported in Nebraska, formerly reported in Kansas, hence, the marked change in population from last year.

⁷ Potawatomi Indians numbering 142 formerly reported in Wisconsin, Great Lakes Agency, scattered bands, now reported in Michigan, Great Lakes Agency, scattered bands.

⁸ A house-to-house canvass was made by the United Pueblos Agency, New Mexico, and the census rolls corrected. Many duplications and unreported deaths were found, causing a decrease in the population from that reported last year.

⁹ Jan. 1, 1936, population.

¹⁰ Formerly included in the estimated statement in text preceding tables.

¹¹ The jurisdiction of 202 Indians was transferred from the Warm Springs Agency to the Umatilla Agency.

OFFICE OF EDUCATION

J. W. Studebaker, *Commissioner*

TO "promote the cause of education", as charged in the organic act the Office of Education during the year ending June 30, 1937, carried on its usual services, and in addition continued to pioneer in some of the newer fields including conservation education, radio, and public forums. These have been further explored with a view to their increasing importance in educational programs of the Nation's schools.

The year has been a significant milestone in the history of land-grant colleges. It was their diamond anniversary. Seventy-five years ago the Morrill Act was passed by Congress and signed by Abraham Lincoln. This act established our national system of land-grant colleges, which today includes many of the country's leading educational institutions. The act granted public land to each State to be sold or used for the establishment of colleges of agriculture and mechanic arts. Some of the States, instead of establishing new institutions, designated existing ones to provide instruction in these fields. Today—after 75 years—there are 69 land-grant institutions with properties and plants valued at nearly half a billion dollars; staffs of faculty members totaling over 28,000; and students, including those in residence and in summer sessions, and those taking extension and correspondence courses, reaching almost a half million.

The rapid rise in secondary school enrollments throughout the country for the past few years has for the first time in the Nation's history brought the number of high-school graduates to a total beyond the million mark in 1937.

EDUCATION'S OUTLOOK IN PUBLIC SCHOOLS

Outstandingly, the horizons of activity of the schools are continually being expanded to include the out-of-school group. At the elementary-school level this tendency is showing itself in increasing

emphasis on nursery schools and kindergartens and the related subject of parent education. At the high-school level increasing attention is being given to the needs of young people who have dropped out of school, whether at the end of the compulsory school age, before completion of the high-school course, or after being graduated from high school. The facilities for their future education most often involve some plan for part-time education, such as night school, part-time day school, cooperative classes, correspondence instruction, and programs combining work and study. In the past, these part-time programs have emphasized chiefly the vocational motive. There seems, however, no reason why part-time programs cannot be more fully developed to serve other important objectives, such as good citizenship, improved home membership, and worthy use of leisure time.

Conservation Education

A service in conservation education was organized during the year in the Office of Education in response to growing demands from schools throughout the country for consultative service and for teaching materials in this field. The plans for immediate service include: (1) A brief survey of work underway in conservation in schools and school systems; (2) preparation of bibliographical material for use in secondary schools; (3) an exploratory conference on conservation education; (4) preparation of suggestive curricular material and teaching guides. Of these the first-named project has been completed and the report printed. Several bibliographies are being prepared. A conference was held in June, which brought together some of the Nation's leaders in this movement. A bulletin of suggestive curricular material is in press. It is hoped that on this foundation an increasingly constructive service in conservation education can be developed.

In schools throughout the country conservation education is gaining ground, as indicated by the following facts: (1) It is included with increasing frequency in the instructional programs of elementary and secondary schools, especially in courses of study in science and the social studies. The subject matter is organized in activity units around important science concepts and themes, and as topics and problems in units of the social studies groups, particularly geography and history. Conservation problems furnish topics suitable for activity units at all school levels in both material and human resources. (2) In universities, instruction in subjects related to the use of natural resources and other background studies is increasingly being pointed toward conservation. Teacher-training institutions are realizing the need for teachers prepared to teach the subject and are offering special courses, both during the regular year and as short

sessions in summer terms. (3) State departments of education in a number of States issue bulletins devoted directly to general instruction in conservation, or prepared to promote special phases of conservation education, such as studies in forestry, wildlife studies, and observance of Arbor Day, bird day, or conservation week.

Curricular and Other Interests

Interest in the curriculum continues to be a strong motive in both elementary and secondary education. This interest was for a time somewhat submerged by the necessity for retrenchment in school expenditures. That it was not submerged is indicated by the speed and the vigor with which it has returned, under the stimulus of State and local school agencies.

In the field of adult education the past year has shown trends to regard educational provisions for adults as part of a regular continuing program for the preparation of the individual for full participation in the society in which he lives. There are evidences of a developing philosophy of adult education that will be effective in defining and establishing its place in American education and in making it an integral part of a publicly supported program.

There is a growing realization that education for effective adjustment to society must give more attention to the individual pupil than has been done under our "mass" system of education. There is thus an increasing tendency in the public schools to provide services for the individual pupil that will aid: In adjustment to school conditions, in orderly progress through school, in the discovery of attitudes and interests that give promise of desirable development, in the early discovery of antisocial attitudes and forms of behavior, in the selection of educational courses, in making a vocational choice, and in placement and adjustment in employment.

The contribution that the industrial arts can make toward the realization of generally accepted educational objectives occupied an important place in the discussion of curriculum problems.

The high death and injury rate from automobile accidents has stimulated the development of systematic instruction in safety in all its aspects. Numerous courses of study on the subject are being used throughout the country.

Efforts are being made by those engaged in the medical work of schools to see that such work is improved and that public funds spent for this work be more effectively administered. There has been a growing interest in the introduction and improvement of instruction in hygiene in the high-school grades.

Increased interest in character education has resulted in measures to correct and prevent behavior difficulties. Such measures include

classes for adults in family relationships, character education curricula, and personal guidance.

Significant among educational developments for handicapped children is the growing conviction that they are a responsibility of the secondary school as well as of the elementary school. Special provision for mentally or physically handicapped pupils of high-school age has in the past been made only in connection with the special classes organized in elementary schools or through segregated schools. A study made during the past year, however, reveals that the high schools are caring for an increasing number of these adolescents through an adjustment of curriculum and equipment to meet their needs. Such a development is but a reflection of the educational principle that the high school exists for all adolescents who can attend day school, regardless of their academic or physical limitations, and that it should plan its program accordingly.

During the year, 44 State legislatures met in regular session and enacted important legislation touching upon many phases of education. The most significant of these acts pertained to school financing. A number of States are assuring a much greater share of the cost of a foundation education program than heretofore; others have strengthened plans which previously had been made for State participation in school support but which lacked effectiveness in the production of adequate revenue. Provisions made during recent legislative sessions for special State taxes to be levied in whole or in part for the benefit of the public schools will undoubtedly raise education standards in financially weak areas of several States and consequently the average standards for such States.

More than the usual amount of legislation concerning teacher welfare has been enacted during the past year. This falls into two general types; (1) provisions for the retirement of aged teachers and (2) teacher tenure designed to give permanency and stability to the teaching profession.

Rural Education

In considering the present outlook in rural education the following trends are significant: (1) The abandonment of one-teacher schools and their replacement by larger centralized schools; (2) the disproportionate increase of the number of rural children attending high schools; (3) the growing disparities in the economic welfare of urban and rural teachers; and (4) marked improvements in the training status of the latter.

During the past 4 years the number of 1-room schools has been reduced by 10,169, or about 7 schools per day. During the same period the number of rural schools offering high-school work has been increased by 883, or 5.3 percent, but the number of children attending

high school in rural communities has been increased by 764,513 pupils, or 53.2 percent. The salary situation is less encouraging. In the past 4 years rural teachers' salaries were cut approximately 20 percent while those of city teachers were cut only about 10 percent. Over a 15-year period statistics show wider and wider disparities between the salaries of these two classes of teachers. Despite this fact great progress has been made in the improvement of scholastic qualifications. Even in the 1-room schools nearly half of the teachers now report 2 years or more of college work, a proportion which nearly doubled during the past 5 years. State certification standards are rising and teacher tenure is improving. If, with these improvements, teachers' salaries and the financial support of rural schools generally can be improved, conditions will be promising for the development of a richer program of education for rural children.

IN COLLEGES AND UNIVERSITIES

Conditions in higher education have shown steady improvement during the past year. The latest reports show a slight reduction in the number of higher educational institutions in this country, notwithstanding an addition to the list of seven new liberal arts colleges and four teachers colleges. The total number of higher institutions of learning as of June 30, 1937, is given at 1,688 as against 1,704 for the year preceding.

College enrollments have increased in nearly 600 accredited institutions for which reports are available. This increase appears to be general throughout the country. In the institutions reporting, full-time enrollments increased in 1936-37 over the year preceding 6.5 percent; and total enrollments have increased 7.5 percent.

According to partial reports, the number of staff members employed in colleges and universities is now nearly back to normal and salaries in a large proportion of institutions, have been restored to former levels.

Many universities and colleges continue to study curriculum problems that are partly the result of the depression. There is a tendency to weed out the less necessary courses of study, to integrate departmental activities, and to stress the importance of the more general studies.

Professional education seems to have held its own during the past year. Enrollment gains were indicated in medicine and law, and only slight losses were shown for theology, dentistry, pharmacy, and teacher education. Demands for well-educated elementary teachers increased materially.

A new approach to the accrediting of colleges recently exemplified by the methods of the North Central Association of Colleges and Secondary Schools is shown also in the procedures of the Engineers' Council for Professional Development. The council began during

the past year a survey of curricula in engineering schools. The survey considers particular curricula rather than the school as a whole, keeping in mind the State laws governing the licensing of engineers for professional practice.

The National Youth Administration has continued the college student-aid program initiated by the Federal Emergency Relief Administration. This has not only helped many students, but has also served to stabilize the incomes of colleges that were largely dependent upon tuition fees.

FEDERAL EDUCATIONAL ACTIVITIES

The scope of Federal activities with respect to education manifested itself along many different lines of action during the year. In addition to the accrued normal functions of the Office of Education, it has continued the five national education projects which were inaugurated by a grant of emergency funds the previous year, namely, the study of local school-administrative units; surveys of vocational education and guidance of Negroes; educational radio project; cooperative university research project; and public-affairs forum project.

Federal education activities were carried on also by a number of new or supplementary Government agencies. The W. P. A. has continued to allot funds to support educational programs for adults through day and evening schools and Americanization classes, and also for young children through nursery schools. These programs, initiated in 1933 and directed or sponsored by public school authorities, have continued to serve age levels for which public schools have not hitherto assumed full responsibility.

The National Youth Administration provides assistance for boys and girls 16-25 years of age in continuing their education in high schools and colleges. The Federal Emergency Administration of Public Works continued to make grants and loans to public school districts for school buildings.

During the year the President created an Advisory Committee on Education, the original purpose of which was to consider the problem of vocational education. Later this committee was enlarged and assigned the function of studying the whole relationship of the Federal Government to the problem of education in general and to make a report and recommendations on the subject.

Recent congressional action concerning education in the several States consisted principally in the inclusion in the Interior Department appropriation bill of approximately \$14,500,000 for the further development of vocational education as provided under the Smith-Hughes Act and acts supplementary thereto, including the George-Deen Act of June 8, 1936.

RESEARCH AND INVESTIGATION IN ELEMENTARY AND HIGH-SCHOOL FIELDS

The Office of Education has continued the study of local school-administrative units in 10 States, begun in the previous fiscal year. The purpose of the project is to explore the possibilities for the organization of more satisfactory schools, attendance areas, and local school-administrative units. The work of the 10 State projects has been guided and coordinated by the Office of Education project staff. By this activity a considerable body of information on attendance areas and administrative units, not previously available, has been gathered. This, in itself, is one of the significant contributions of the study.

Each State project staff has prepared either a summary or an extended report for every county studied. These reports summarize the basic data collected for school units within the county and present proposals for changes in the organization of those units. In addition, each State project has prepared and is printing a State report describing, on a State-wide basis, the status of existing attendance areas and administrative units, evaluating the existing situation and proposing a State-wide program for the organization of more satisfactory school units. Significant and practical results are already apparent from this study. In most instances, recommendations growing out of the work of the projects have been made an integral part of the program of the State department of education. In some States, such recommendations have been enacted into law and in all States, the proposed changes in the organization of attendance areas and administrative units have stimulated a healthy discussion of local school units and their problems.

On the basis of data submitted by the State projects, the Office of Education is preparing publications describing the work of the project, analyzing the status of existing school units in the 10 States, and evaluating the procedures followed in conducting the project.

The Office of Education has continued its program of studying current acts of Congress and the various State legislatures affecting education. Two circulars were issued on current school legislation during the year. These circulars summarized the most important legislation enacted by Congress and the State legislatures in 1936 relating to education. Also, during the year there has been prepared a biennial review of educational legislation in 1935 and 1936.

A study is in progress to discover to what extent colleges, universities, and teacher-training institutions are offering opportunities for the orientation of teachers in parent education; what subjects are being offered for this purpose; where prospective teachers might expect to find such courses.

Another study in parent education is concerned with parent education programs in city school systems. Information has been assembled through questionnaires and field consultations with directors of parent education and superintendents of schools in a selected number of large cities.

A study has been made of features constituting the various State plans for financing the public schools. It aims to set forth the basic principles of government upon which the States outline their legislative programs for financing the schools, the essential features of such programs, and certain relative data.

In the field of secondary education the following studies were completed: Needed Research in Secondary Education, which is based upon the findings of the national survey of secondary education; Trends in Secondary Education, dealing with recent developments; the textual material to accompany the statistics in public high schools; subject registrations in private high schools and academies, and subject registrations in public high schools. A study was made of the special subject and general supervisory personnel for elementary and secondary grades in 2,000 cities having a population of 2,500 or more; of the preparation offered by colleges and universities for general and special subject supervisors. Recently constructed report cards of pupil progress in elementary grades were analyzed and trends in the development of such cards were noted.

An analysis of 1,664 courses of study was made to show present trends in organization, methods of construction, objectives, pupil activities, and teacher helps and guides.

During the period when the economic depression was having the most serious effects upon the schools, the Office of Education presented relevant data in a number of different publications. In order to have a permanent record of some of these important findings, a bulletin which reviews and brings these findings together has now been prepared. The lack of similar information concerning the effect of previous depressions made it evident that such a record is desirable.

IN COLLEGES AND UNIVERSITIES

Among the studies conducted during the year in the field of higher education are the following: Student Mortality in Colleges—approximately 15,000 freshmen who entered the several schools and colleges of higher education institutions were followed through their college years since 1931-32. Analyses were made of the extent to which these students remained in college, the causes of withdrawal, and related facts.

Another cooperative effort included returns from 642 colleges and universities. Insurance and annuity plans suitable for colleges and

universities were discussed, the extent of their use indicated, and important features presented. Other studies in process during the year included an analysis of the methods of control exercised by the executive branch over State institutions of higher education; Unit Costs of Higher Education; and Continuity of College Attendance. Data were secured from replies to a questionnaire sent to all colleges of arts and sciences (including those that are divisions of universities) listed in the Educational Directory for 1936.

A study of financial aid to college students through employment opportunities and means offered for reducing student expenses was also conducted by means of a questionnaire sent to all institutions of higher learning, by correspondence, and through visits to a few institutions known to afford unusual opportunities for self-help.

An analysis of faculty salaries paid by colleges and universities in 1936 to faculty members was made, including land-grant colleges, State universities, privately controlled institutions, and denominational colleges.

The Office of Education has continued its investigations in the problems of graduate study and research.

IN SPECIAL EDUCATION

The Survey of Vocational Education and Guidance of Negroes continued through the year. Its purpose was to supply a body of facts upon which an effective program of curriculum reorganization in the field of vocational education and guidance may be developed. Data were collected from approximately 200 communities in 34 States.

Some of the values of the survey are: (1) Information on facilities and opportunities for vocational education will serve in determining the present status of this important phase of the education of Negroes. (2) Studies of 2,000 evening-school students and of 20,000 graduates and nongraduates of high schools will give some indication of the relation between schooling and subsequent experience. (3) Trends in enrollment in certain vocational courses and the extent to which States utilize Federal funds in providing vocational education for Negroes are shown in a special study on this subject. (4) Personnel information on 27,000 Negro high-school students should have important implications for vocational education and guidance programs.

Research activities in rural education have included: (1) Report of a survey of education in the southern mountains, appraising the economic and social conditions of the more mountainous counties of six Southern States and comparing the educational conditions in these counties with those of the nonmountain counties of the same States; with those of the States as wholes; and with those of the United States. (2) A report of the present status and trends in rural-school personnel,

including data from more than 200,000 teachers and principals employed in the rural schools and showing their salary, training, experience, and maturity status. (3) A brief survey of the present status and trends of the movement to provide professional supervision for rural schools. (4) Preparation (with the cooperation of several leaders in the field working outside the Office of Education) of material for a chapter of the biennial survey on "Review of conditions and developments in education in rural and other sparsely settled areas."

IN COMPARATIVE EDUCATION

As a major investigation for the year, a staff member visited Yugoslavia to study the school system in all its aspects, gather official and other publications relating to education in that country, and collect such data as would be valuable for a bulletin on the subject. The project included a brief visit to Albania and a cursory survey of education there.

Preparation of the bulletin on institutions of higher education in Germany was continued throughout the year.

A decennial survey of education in countries other than the United States, to be a part of the biennial survey, was made for Europe, Asia, Africa, and Australia. The western continents are still to be reported on. A brief special study was made of education in the island of Rhodes.

IN STATISTICS

With education in the United States administered as a State and local function, the Office of Education carries on, as one of its major responsibilities, the collection and presentation of information on a national basis for this locally administered educational system.

Material was collected by mail and field service for the school year ending in June 1936 and tabulations made as shown in the following table, in which the capital letter "C" stands for data collected and "T" tabulated and "C-T" collected and tabulated within the year.

Subject of study, 1936-37	Type of study		
	Biennial	Periodic	Special
State school systems:			
Personnel and finances.....	C		
Preliminary statistics.....	C-T		
County school systems: Personnel and finances.....			T
City school systems:			
Personnel and finances.....	C-T		
Per capita costs.....		C-T	
School janitor service.....			T
Higher education:			
Personnel and finances.....	C		
Land-grant colleges.....		C-T	
Receipts and expenditures (preliminary).....		C-T	
Student health.....			T
Instruction in hygiene.....			T
College salaries (1936).....		C-T	
Continuity of college attendance.....			C-T
Economic status of college alumni.....			C-T
Student mortality in universities.....			C-T
Unit costs in higher education.....			C

Subject of study, 1936-37	Type of study		
	Biennial	Periodic	Special
Secondary schools:			
Personnel.....	T		
Subject registrations.....		T	
Elementary schools: General and special supervision of instruction.....			T
Teaching staff: Rural salaries, tenure, and experience.....		T	
Libraries:			
Public elementary and secondary school.....		T	
Public library trends.....			T
College library trends.....			T
Residential schools for exceptional children: Personnel and finances.....	C-T		
Visual aids in education.....			T
Public school building needs.....			C-T

IN OTHER FIELDS

The investigation concerning instruction in hygiene in colleges and universities was completed and published during the year under the title, "Instruction in Hygiene in Institutions of Higher Education."

A review of data concerning health instruction in both high schools and colleges, from the point of view of the student, was collected from 100 colleges and will be published under the title, "Student Needs and Interests in Hygiene."

The medical and nursing services of colleges and universities for the preservation of the health of these students and the care of the sick were investigated and will appear shortly as Health Services in Institutions of Higher Education. A study which has long been in progress concerning the influence of school life on the growth and longevity and general physical condition of children was completed and published as *The Physique of the School Child*.

A study was completed in cooperation with a few outstanding persons in the field of industrial arts education of the place and function of industrial arts in the public-school programs. In cooperation with 13 institutions of higher education, a study was made of the relation between high school and college. Information on the status of guidance in cities having a population of 100,000 or more was collected and compiled. Information on guidance programs in the various States was collected from State departments of education and compiled. A study was made of recent developments in adult education and a report was prepared that deals with the purposes, philosophy, and trends in this phase of education.

In the field of measurements and testing, studies along the following lines were conducted: Factors in the adjustment of college students; cumulative record cards and statistical forms for studying pupil progress.

The new division of library service in the Office of Education has been in process of development during the year. Six library specialists have been brought in to work on the following definite problems: Professional library education; school library administration; library

standards; housing and equipment of school libraries; library statistics; library service to C. C. C. camps.

PROMOTING AND COORDINATING RESEARCH

Requests to the Office of Education for assistance in making studies of education in other countries totaled 204 during the year. This shows an increase of 26 percent over the number of similar requests the previous year. For nearly every one of the 204 studies, one or more bibliographies, long or short depending on the nature of the subject, were furnished. In addition, a special bibliography on education in Japan was compiled; a list of references on the history of education in Russia was arranged; and an article was written for the *Journal of Educational Research*. The regular annual list of references on comparative education was furnished the *Journal of Elementary Education*.

UNIFORM RECORDS AND REPORTS

The Office has continued its cooperative efforts in the interest of more uniform records and reports in the field of State school systems and libraries. A new set of definitions of terms used in State school statistics was formulated. From the results of various conferences the reporting form to be used in 1937-38 has been completed and sent to the States, with instructions to guide them in setting up the materials they will collect for 1937-38. A committee from organizations interested in public library statistics cooperated with this Office through the American Library Association in preparing a form to be used by State library agencies, the American Library Association, and this Office in collecting statistics.

COOPERATIVE RESEARCH

The university research project closed officially on June 30, 1937, after operating about 1½ years. Sixty universities located in 32 States, the District of Columbia, and Hawaii joined the Office of Education in this activity. More than 165 separate study reports for 40 studies were made by the universities, and the major findings were assembled and coordinated by the Office. Findings are being made available in 11 bulletins and 4 pamphlets. Many of the universities are also publishing material growing out of this research.

More than 60,000 individuals and hundreds of institutions of higher education assisted in providing data for the several studies. A number of the institutions continued work on the former project studies on their own funds after the project closed. It is believed that the success of this undertaking will encourage future research programs involving cooperative activities of the Office of Education and of the higher education institutions.

THE LIBRARY

The library of the Office of Education, together with libraries of three other bureaus of the Department of the Interior, is now established in the new Interior Building. Here a more extensive library service will be developed than has been possible heretofore.

A revised list of publications of the Office has been prepared and this list, which covers the publications issued from 1910 to 1936, will help librarians and students of education in obtaining material and completing files.

The work of the library has increased as new projects have been undertaken in the Office. Many calls for books outside the scope of this collection necessitated an increased number of interlibrary loans from other libraries. On the other hand, many books and theses have been loaned from this library to other libraries in various parts of this country and Canada.

During the year a series of articles by members of the library staff appeared in *School Life*, describing various activities and collections of the library. Following the publication of these articles several gifts of college catalogs and valuable old textbooks were received from institutions and individuals throughout the country.

The State and city boards of education were circularized for courses of study and many were received, bringing the already extensive collection fairly up to date.

During the year an unusual amount of binding has been done, taking care of files of reports, both foreign and domestic, which had never been completed and bound and which were in danger of being lost or remaining incomplete.

It is the hope of the library personnel that the enlarged quarters and better equipment may be reflected in greatly improved service for the future.

SIGNIFICANT DEMONSTRATIONS IN PUBLIC FORUMS

The public forum project during the year established and sponsored in cooperation with local boards of education, 19 public forum demonstration centers in rural and urban communities in all sections of the country. The purpose of these projects was to demonstrate a community-wide program of public discussion of public affairs for youth and adults under local educational management and in different types of communities. The 19 centers selected represented a total gross population of approximately 4,000,000 people.

The development of the program may be divided into three phases: (1) Preparation and planning for 10 projects, July 1, 1936, to September 1, 1936; (2) operation of community-wide forums in 10 centers, September 1, 1936, to February 1, 1937; (3) operation of 18 centers

for all or most of the period between February 1, 1937, and June 30, 1937.

Between September 1, 1936, and February 1, 1937, 10 projects conducted 3,895 meetings attended by 350,810 people. Between February 1, 1937, and June 30, 1937, 18 projects scheduled 6,119 meetings attended by 634,473 people. It should be noted that some of the projects during the latter period terminated their schedules in March, still others in April, a few in May, and practically all by June 15. The project organized a total of 10,014 forum discussions with an attendance of 985,283 people. In addition to these meetings the various projects organized 1,187 radio forums, sold or distributed over 60,000 pamphlets on public affairs to augment the discussions by follow-up reading, and prepared thousands of charts, graphs, and other visual aids for use in connection with the discussions.

About 237 different leaders of discussion served the projects varying lengths of time, conducting on the average six or seven forum meetings per week. These leaders were chosen by the local educational managements.

About 100,000 days of work were performed by professional and skilled workers certified to the projects by the Works Progress Administration in such capacities as artists, writers, promotion assistants, discussion leaders for small groups, research assistants, assistant librarians, accountants, bookkeepers, typists, stenographers, and clerks.

The administrative staff in the Office of Education included an assistant administrator, field counselor, research assistants, clerks, and stenographers. This Office carried on all the correspondence necessary to establish the demonstration centers and served these centers as a clearing house during the period of operation. In addition, this staff prepared for publication and distribution seven publications and a monthly digest of project developments. These publications reached approximately 150,000 people and served the adult civic education movement in many ways. A careful plan of research was developed by the administrative staff and each project carried forward a plan of reporting its activities and program development. In addition to the direct responsibilities for a service to the projects sponsored by the Office of Education, the administrative staff completed a survey of 431 forums under various auspices, and provided a counseling service which assisted the leaders and directors of more than 150 forums under different auspices.

The administrative staff also prepared numerous articles and reports for newspapers, magazines, and various publications, thus spreading a knowledge of the program as a whole.

One of the activities of the administrative staff was the organization of plans to encourage increased reading of public affairs informa-

tion. Pursuant to this objective, the administrative staff published two indexes of Public Affairs Pamphlets, the first containing about 300 titles, the second together with mimeographed supplements, listing over 900 titles. These carefully cross-indexed and annotated bibliographies of pamphlet material were distributed widely and used not only by forums but by librarians, college and high-school teachers, and leaders of civic and educational organizations throughout the country. In connection with this index and in cooperation with the American Library Association and the public affairs committee, the administrative staff of the public forum project organized 30 pamphlet display centers. These displays, usually attractively laid out in libraries, brought hundreds of current pamphlets on current affairs to the attention of the civic and educational leaders.

Also in cooperation with the American Library Association the administrative staff organized a bulletin which will be ready for printing in the near future dealing with practical methods of library service to forums and discussion groups.

The thousands of letters received by the Office of Education from educators and civic-minded people in all parts of the country indicate a Nation-wide interest in the work of this division and the widespread influence of the demonstration program.

IN EDUCATIONAL BROADCASTING

The broadcasting and radio activities of the Office of Education embrace three phases: (1) Demonstration programs over coast-to-coast networks; (2) services to local broadcasters and educators; (3) activities to train and help educators use radio effectively.

Activities were carried on under an allotment from emergency funds made October 1, 1936, to the educational radio project. This allotment made possible further continuation of the project originally initiated December 1935. The principal objectives of the project were: (1) To provide employment for W. P. A. and C. C. C. radio and script-writing talent; and (2) to discover ways in which radio can be used for the promotion of education, both for organized instruction as well as for general enlightenment. The National Broadcasting Co. and the Columbia Broadcasting System have made generous contributions in time, personnel, studio facilities, and counsel.

Programs

The Office of Education conducted seven series of coast-to-coast programs during the year. These were: Have You Heard? natural science, N. B. C.; Answer Me This! questions and answers on historical and sociological facts, N. B. C.; Education in the News, reporting developments in fields of education; Safety Musketeers, safety education, C. B. S.; The World Is Yours, dramatizations of

the activities and exhibits of the Smithsonian Institution, C. B. S.; Treasures Next Door, dramatizations of excerpts from the "best sellers" of all times, C. B. S.; Let Freedom Ring, dramas of mankind's struggle for civil liberties, C. B. S.

That a vast audience exists for such programs is evidenced by the fact that more than 400,000 listeners—young and old, from every State in the Union—responded by letters to the Office of Education.

The first national school assembly—commencement exercises for graduating classes—was held May 14, with Secretary of the Interior Harold L. Ickes, and other speakers participating. Other "special events" broadcasts held during the year included programs in honor of Inauguration Day and American Education Week.

Script Exchange

For many years school officials and local broadcasters have been searching for scripts which are both significant and entertaining. To supply this need, the radio project, in cooperation with the National Association of Broadcasters, established the Educational Radio Script Exchange. The script exchange has filled requests for 54,000 scripts, which have been produced in 42 States, over 114 radio stations.

In addition to serving as a depository and point of distribution for scripts, the exchange prepared and distributed aids to school groups wishing to go on the air. These aids include a Manual of Suggestions for producing radio programs and a glossary of terms used in the radio industry. Thirteen scripts, showing the functions of municipal government, were prepared in cooperation with the Public Administration Clearing House and the Rockefeller Foundation. This series was broadcast over Station WTNJ, Trenton, N. J. These scripts are now being edited for distribution to local radio stations through the script exchange.

In order that the experience gained from the experimental radio programs may be widely drawn upon, the Commissioner of Education authorized a limited number of educators to observe and participate in the production of the Office of Education's radio programs. Teachers and school officials from a score or more States participated in this radio workshop operated in cooperation with the New York University. Practice and observations were conducted in New York City. The National Broadcasting Co. and the Columbia Broadcasting System assisted extensively in this venture. Three sessions of the workshop trained more than 80 persons who are now practicing and promoting educational broadcasting in their own communities.

The problem of improving the quality of educational broadcasting—on national as well as local air lanes—is one requiring sustained experimentation and study. Toward the solution of this problem the project has made distinct contributions.

The project has experimented in the application of techniques of radio-program organization and presentation which can now be passed on to local educators. It has applied on a Nation-wide scale the use of print to supplement radio; and the project's supplementary printed materials have been acclaimed by listeners as being invaluable to better comprehension of educational radio programs. It has discovered an extensive radio audience for educational radio programs; and the discovery will undoubtedly lead broadcasters to set aside more time than heretofore for programs of an educational nature.

On the other hand, the receptiveness of the audience to educational broadcasts is leading public agencies to attempt to learn the art of disseminating information about their activities. More than a score of Federal agencies have turned to the radio project for help in script writing and production. To these agencies the project has given its full cooperation.

EDUCATIONAL POLICY FORMING

In response to demands of State departments of education for information on education throughout the world, the Office has acted as a clearing house for circulars and press releases of the International Bureau of Education. It has also given information relative to certification of foreign students and applicants for professional licenses.

Staff members have served on policy forming committees of organizations outside the Office, including the following: American Council on Education; National Education Association; National Committee on Research in Secondary Education; Cooperative Study of Secondary School Standards; National Research Council; National Conference of Supervised Correspondence Study; National Council of Parent Education; American Library Association; National Congress of Parents and Teachers; International Council for Exceptional Children; National Negro Student Health Association; National Tuberculosis Association; American Association of School Physicians; and others.

Among important world conferences at which the Office was represented were the Fifth International Conference on Public Instruction, the International Conference on Health in Universities, and the Seventh World Conference of New Education Fellowship.

FEDERAL RADIO EDUCATION COMMITTEE

Radio is more and more coming to take its place in the American educational system, but the most successful use of it by educators continues to be a challenging experiment.

Agreement as to what are the common problems of broadcasters and educators has been reached in considerable measure in meetings,

during the year, of the subcommittees of the Federal radio education committee. Comprehensive studies of these common problems are to be undertaken within the next few months. Briefly, the studies may be characterized as follows:

1. A survey of cooperative efforts—in local and State areas.
2. Development of an experiment and idea exchange—To support the Office of Education in conducting a clearinghouse where findings may be made available to broadcasters and listeners.
3. Teacher training—To prepare proposed courses for teacher training in the use of radio.
4. Publicizing programs—A study of methods and media of publicity.
5. Listening groups—to examine the educational value of listening groups and the organization and motivation behind them.
6. The problems and methods of broadcasting to and by schools.
7. Methods of training production managers in educationally owned stations.
8. Collection of experiences of network series—in pamphlet form.
9. Survey of public opinion—To determine what the listening public considers of educational value in radio programs.
10. Essential value of radio to all types of listeners—To determine what educational broadcasting is—what makes a radio broadcast "effective" before educational broadcasting can become consistently "effective."

It is estimated that the cost of carrying on such a study program will amount to approximately \$250,000 over a period of 2 years. At a meeting attended by the chairman of the Broadcast Division of Federal Communications Commission, the Commissioner of Education, the presidents of the Rockefeller and the Carnegie Foundations and representatives of the broadcast industry, it was agreed that if the necessary amount were divided into approximately three equal parts, each foundation would contribute one-third of the fund and the radio industry, the remaining third. Certain of the studies will be carried on in the Office of Education under the direction of the Commissioner. Other studies will be undertaken by institutions and organizations with research facilities where the nature of the study seems to lend itself to attack by an agency having a particular interest in it and an available staff which can at once begin work.

With the inauguration of certain fundamental inquiries and the operation of controlled experimentation, the work of the Federal radio education committee—the official agency authorized to coordinate efforts of educators and broadcasters—should progress to the end that broadcasting may achieve the greatest social usefulness.

SERVICE IN THE FIELD

Extensive investigation was made by the Office during the year relative to the work being done in conservation education in various parts of the country. Universities, State departments of education, and local school systems were visited in order to confer with indi-

viduals active in the development of conservation education in the schools.

Consultation and advisory services on school-building problems were given in various States where such service was requested.

At the request of the State superintendent of schools in Virginia, and of the county superintendent of Arlington County, a study was made during the year of certain problems connected with the education of handicapped children in the local schools of the county, and recommendations were submitted for adjustment of the same. At the request of the superintendent of schools of Philadelphia, the Office made a study of the plans for the organization of work in the two new vocational schools of that city, and a staff member served in an advisory and consultative capacity at a meeting of administrative officers called to review the proposed program for the schools.

Individual staff members have rendered consultative services in person or by extended correspondence to a large number of school officers, organizations, or agencies.

Participation in meetings—National, State, and local—of staff members included practically every field of educational interest during the year. Likewise, cooperation with professional and public service groups was most extensive.

INFORMATION SERVICE

Increased demand for, publications of the Office of Education resulted in an increase of approximately 62 percent in free distribution this fiscal year over the past fiscal year. The total reached 544,347.

School Life, official organ of the Office, issued monthly from September through June, increased its paid circulation during the year by 64.2 percent. Its total paid circulation reached 12,858. March of Education, the news letter of the Commissioner of Education, went to school executives to transmit quickly, from time to time, important information reaching the Office of Education.

A total of 77 manuscripts were prepared for publication within the year, excluding the 10 numbers of School Life. More than 300 charts, graphs, maps, and other illustrative material were constructed.

In the editorial division alone, 44,749 letters of inquiry about publications were received. Other divisions likewise had heavy correspondence, which together made a grand total of 692,448 pieces of incoming mail.

Reports available relative to public addresses and articles by members of the Office staff indicate a total of 177 addresses and 72 articles published in various periodicals outside the Office.

The Office continued its cooperation with newspapers and journals by preparing 192 press notices dealing with Office activities, trends in education, and general news about America's schools.

EDUCATIONAL EXHIBITS

Included among the extensive educational exhibits prepared by the Office during the year were those for the American Vocational Association, National Education Association, National Catholic Education Association, Northwest Territory Celebration, National Congress of Parents and Teachers, American Association for Adult Education, American Library Association, and others.

Committees from the staff of the Office of Education have assisted in plans for both the museum and the art gallery in the new Interior Building.

PUBLICATIONS PREPARED DURING THE FISCAL YEAR, 1936-37

Bulletins

1935

- No. 2. Chapter I, Statistical summary of education, 1933-34.
- No. 2. Chapter III, Statistics of city school systems, 1933-34.
- No. 2. Chapter IV, Statistics of higher education, 1933-34.
- No. 2. Chapter V, Statistics of public high schools, 1933-34.

1936

- No. 11. A guide to curriculum adjustment for mentally retarded children.
- No. 12. Public education in Alaska.
- No. 13. The deaf and hard-of-hearing in the occupational world.
- No. 14. Poland's institutions of higher education.
- No. 15. Authority of State executives over higher education.
- No. 16. A step forward for adult civic education.
- No. 17. William Torrey Harris.
- No. 18-VI. Youth: Community surveys.
- No. 19. Functional planning of elementary-school buildings.

1937

- No. 1. Part I, State and county school officers.
- No. 1. Part II, City school officers.
- No. 1. Part III, Colleges and universities.
- No. 1. Part IV, Educational associations and directories.
- No. 2. Volume I, chapter II, Trends in secondary education.
- No. 2. Volume I, chapter V, Review of educational conditions and developments in rural and other sparsely settled areas.
- No. 3. Public affairs pamphlets.
- No. 4. Conservation in the education program.
- No. 5. Insurance and annuity plans for college staffs.
- No. 6. Bibliography of research studies in education, 1935-36.
- No. 7. Student health services in institutions of higher education.
- No. 8. Education of Negroes—A 5-year bibliography, 1931-35.
- No. 10. Economic status of college alumni.
- No. 11. College student mortality.
- No. 12. Some factors in the adjustment of college students.
- No. 13. Economic status of rural teachers.
- No. 14. Successful practices in the teaching of English to bilingual children in Hawaii.

- No. 15. Learning English incidentally: A study of bilingual children.
- No. 16. Student interests and needs in regard to hygiene.
- No. 17. Opportunities for the preparation of teachers of exceptional children.
- No. 18. Opportunities for the preparation of elementary school supervisors.
- No. 19. C. C. C. camp education: Advisers, enrollees, and program.
- No. 20. Education for the public service: Study of the civil service in New York City.
- No. 21. Vocational education and guidance of Negroes.
- No. 22. List of publications of the Office of Education and the Federal Board for Vocational Education, 1910-36.
- No. 23. Professional library education.

Pamphlets

- No. 70. Per capita costs in city schools, 1935-36.
- No. 71. An annotated bibliography on the education and psychology of exceptional children.
- No. 72. Status of rural school supervision.
- No. 73. Subject registrations in private high schools and academies.
- No. 74. Crucial issues in education.
- No. 75. Safety and health of the school child.
- No. 76. Successful methods of teaching English to bilingual children in Seattle public schools.
- No. 77. Opportunities for the preparation of teachers of native and minority groups.
- No. 78. Unit costs of higher education.
- No. 79. State school taxes and school funds and their apportionment.
- No. 80. Sources of visual aids and equipment for instructional use in schools.

Leaflets

- No. 34. State library agencies as sources of pictorial material for social studies.
- No. 35. Essentials in home and school cooperation.
- No. 38 (revised). Instruction in the effects of alcohol and tobacco.

Bibliographies

- No. 2 (revised). Guidance.
- No. 3 (revised). Supervision of instruction in rural schools.
- No. 4 (revised). The education of women.
- No. 21 (revised). Secondary education: Instruction.
- No. 37. Elementary education: Organization and management.
- No. 43. Elementary education: Teaching methods.
- No. 46. Education for family life.
- No. 49. Higher education: Control, organization, and administration.
- No. 50. Higher education: Curriculum and instruction.
- No. 51. Student personnel work.
- No. 52. Educational problems of the southern highlands.
- No. 53. Changing philosophies in higher education.
- No. 60. Government publications for parents and leaders in parent education.
- No. 61. Government publications on health, physical education, and recreation.
- No. 62. Government publications showing the work of the Government.

INTERNATIONAL RELATIONS

Efforts toward improved international intellectual relations have had six distinct phases during the year: Assisting the Department of State in the selection of official delegates to represent the United

States at international conferences and congresses; nominating persons to receive scholarships offered by other countries; meeting educators from other countries and planning itineraries in the United States for them; assisting members of the Office and other Americans in arranging for travel abroad; working toward the accrediting of American schools abroad; and helping keep foreign mailing lists up to date.

While the Office annually replies to many requests for data about special opportunities to study abroad, until 1936-37 it did not attempt to select recipients of scholarships or fellowships or in any way to administer them. At the request of the Department of State and in cooperation with the Institute of International Education, it canvassed universities in the United States and nominated two persons to receive scholarships awarded by the Chilean Government for attendance at the summer school of the University of Chile in January and February 1937.

It also took up with the University of Heidelberg, Germany, the matter of aiding the university in its selection of young Americans to benefit by the scholarships it offers. The present status of the arrangement is that the Office of Education will pass upon the credentials of all applicants.

During the year the Office has had considerable correspondence with the National Association of Regional Standardizing Agencies, and its four principal constituent members, on arranging accreditation for all American schools abroad which may qualify. The present arrangement with the president of the National Association is that he will furnish the Office a statement of the areas of the world assigned to each of the four agencies, and during 1937-38 the Office will circularize these schools and aid them in understanding the methods and purposes of accreditation.

ADMINISTRATION AND SUPERVISORY ACTIVITIES

C. C. C. EDUCATIONAL PROGRAM

At the beginning of the fiscal year 1936-37, the C. C. C. educational program had been in operation for 2½ years. During that time certain practical objectives had been developed out of the expressed needs and interests of the enrollees; C. C. C. officials had become acquainted with these objectives and the methods of achieving them; the administrative organization of the program had been completed; the educational personnel had been carefully selected and trained, and had gained experience in camp work; and finally, the program had been extended to include 75 percent of the enrollees who participated in it on a purely voluntary basis.

The C. C. C. educational program, therefore, entered into its third fiscal year with clear-cut objectives, a trained personnel, and a record of successful experiences. It was considered no longer an

experiment, but an essential part of the entire C. C. C. program. This year witnessed the extension of the educational program to include almost 90 percent of the enrollees, but much more than that, there was improvement in the educational activities and the content of the instruction offered. The previous years might be characterized as a period of experimentation and extension of the program—this year might be called a year of consolidation of the ground already gained. At the close of the fiscal year, Congress extended the Civilian Conservation Corps for a period of 3 years and emphasized the importance of the educational program by establishing the corps, "for the purpose of providing employment, as well as vocational training, for youthful citizens of the United States who are unemployed and in need of employment * * *" The act also provided, "That at least 10 hours each week may be devoted to general educational and vocational training" and finally authorized, "That in the discretion of the director continuous service by the enrollee during his period of enrollment shall not be required in any case where the enrollee attends an educational institution of his choice during his leave of absence."

The administration and organization of the program remained unchanged during the year. In accordance with the original Executive order establishing the program, the War Department was responsible for its execution with the advisory assistance of the Office of Education. The other agencies of the Department of the Interior, Department of Agriculture, and Department of Labor were to cooperate with the War Department in this work. The Office of Education appointed a national director of C. C. C. education to act as adviser to the War Department; corps area advisers to act as advisers to the corps area commanders; district advisers to act as advisers to the district commanders; and camp advisers to act as advisers to the camp commanders.

Of the 4,500 men who have been appointed as camp educational advisers, 1,863 were still on duty in June 1937. Ninety-nine percent of these men are college graduates, 74 percent having the bachelor's degree, 22 percent having the master's degree, and 1 percent the doctorate. Two percent have a teaching certificate only and 1 percent have neither a degree nor a teaching certificate.

The educational reports for the past fiscal year show a remarkable picture of the growth of the educational facilities in the camps which can be attributed solely to the ingenuity and hard work of the officials and enrollees. In the past, approximately \$100 per company per year has been allotted for the purchase of educational supplies and equipment and in addition about 300 books and 30 magazines and newspapers have been supplied to each camp.

The reports show that of the 1,900 camps, 60 percent now have schoolhouses and 77 percent have constructed and equipped vocational training shops. These schoolhouses and shops range from 10 by 10 cubicles to large buildings with several thousand square feet of floor space. Equipment in some camps consists only of a few hand-made knives used for wood carving; in others there are elaborate power tools and other facilities. Thirty-nine percent of the camps have schoolhouses with more than a thousand square feet of floor space and 9 percent have shops of this size. In the average school building there are four small classrooms. Seventy percent of the camps have a separate room for the library and 83 percent have a separate room for reading. The total value of the shop tools and equipment is estimated at \$260,000. The library in the average camp has been expanded from 200 to approximately 800 books. It is reported that 76 percent of the camps have adequate lighting facilities for classrooms and shops. The following table gives these data in detail:

Physical Facilities for Education as of June 30, 1937

Total number of C. C. C. companies-----	1, 900
Number camps having schoolhouses-----	1, 146
Percentage camps having schoolhouses-----	60
Number camps having 1,000 square feet of classroom space-----	746
Percentage camps having 1,000 square feet of classroom space-----	39
Total number of classrooms-----	5, 255
Number of classrooms per schoolhouse-----	4. 6
Number camps having shops-----	1, 460
Percentage camps having shops-----	77
Number camps having 1,000 square feet of shop space-----	181
Percentage camps having 1,000 square feet shop space-----	9
Total value of shop tools and equipment-----	\$262, 768
Number camps having special room for library-----	1, 326
Percentage camps having special room for library-----	70
Number camps having reading rooms-----	1, 571
Percentage camps having rooms-----	83
Number camps having projectors for educational purposes-----	972
Percentage camps having projectors for educational purposes-----	51
Total number projectors owned by the camps-----	690
Number of textbooks-----	393, 155
Number of reference books-----	221, 181
Number of library books not including text and reference books-----	941, 141
Total number of books-----	1, 555, 477

During the summer months approximately 27,000 persons acted as instructors, and during the winter months approximately 30,000. Of this number, only 3,800 (the educational advisers and their assistants) devote their entire time to the educational program. The others have been drafted from the Army officers, technical personnel, and enrollees in the camps, from Federal relief organizations, and the regular school systems.

Throughout the development of the camp program of instruction, guidance and individual diagnosis have served as the foundation of all educational effort. The needs and interests of the men are so varied that any program of instruction for them must be elastic and adaptable. Educational activities evolved to meet enrollee needs include the following: (1) The elimination of illiteracy; (2) removal of deficiencies in common school subjects; (3) training on the job; (4) general vocational training; (5) avocational training; (6) cultural and general education; (7) health and safety education; (8) character and citizenship training; and (9) assisting enrollees to find employment.

A cumulative record card is kept on the progress of each enrollee. In addition to the enrollee's academic and vocational rating on the card, there is recorded the result of each interview held with him. The use of this card helps greatly in the individual guidance and placement of the enrollee.

The educational activities may be roughly classified in six groups: Academic courses, vocational courses, informal activities, professional training, miscellaneous activities, and certain general activities. During the average month of the past year, about 53,000 courses and activities were carried on in the camps. In an average company there were approximately 26 courses, of which 7 were academic; 8 were vocational; 4 were connected with the job training activities; 3 were informal activities (arts and crafts, dramatics, music, etc.); 2 are classified as miscellaneous (first aid, health, and safety courses); and 2 are classified as professional.

The reports show that from 85 percent to 90 percent of the men participate in the educational program. Most of these men attend two and sometimes three or more different courses and activities. Six out of every 10 men attend the miscellaneous courses; 5 out of 10 attend the job-training courses; 4 out of 10 attend the other vocational courses; 3 out of 10 attend the academic courses; 2 out of 10 attend the informal activities; and 1 out of 10 attend the professional courses.

Academic courses in the C. C. C. include those subjects common to the elementary, high-school, and college curriculum which are not vocational. The reports reveal that 3.2 percent of the enrollees are illiterates; 39.3 percent have not completed the elementary grades; 46.3 percent have not completed high school; 11 percent are high-school graduates; and 0.2 percent are college graduates.

The extent of participation in the academic courses varies markedly on the different levels of education. Thus 9 out of every 10 illiterates are taking literacy courses; 4 out of 10 on the elementary level are taking elementary courses; 3 out of 10 on the high-school level are taking high-school courses; and 7 out of every hundred on the college level are taking college courses.

The work projects in the field offer opportunities for training in a wide variety of occupations, and the jobs required for the operation and maintenance of the camp add a number of other opportunities for training. Instruction on these jobs is given by those who supervise the work. The report for June 1937 shows that 51 percent of the enrollees are now participating in job training.

In addition to the 8,098 job-training courses given during June 1937 there were 14,864 other vocational courses given in the camps. These vocational courses which were attended by 115,331 men, were entirely distinct from the regular job-training program. They were offered during leisure time and comprised subjects in which the enrollees expressed an interest. Among the most popular of these subjects were commercial courses, mechanical trades, journalism, carpentry, art, cooking, forestry, photography, accounting, and business management.

Camp educational officials have attempted at all times to train enrollees to make the most constructive use of their leisure time. Organized informal activities include arts and crafts, dramatics, music, discussion groups, camp newspapers, hiking clubs, and hobby groups. Recent reports indicate that approximately 22 percent of the men engage in these activities.

Safety, health, first aid, and life saving are, of course, important subjects of instruction in camp life. The report shows an attendance of approximately 174,000 men for these courses during the month of June 1937.

Camp libraries have been expanded to the extent that more than 1,500,000 books are now available to the enrollees. During the past year the circulation of books has averaged 300,000 per month and about 50 percent of the enrollees are regularly engaged in reading. Approximately 6,500 films dealing with a wide variety of subjects are shown to the men every month and more than 1,600 camps now publish a camp newspaper.

Agencies of the Federal, State, and local governments, as well as educational institutions, fraternal and civic organizations, have aided the C. C. C. educational program. The Works Progress Administration supplies some 2,000 teachers; the National Youth Administration, several hundred more. The State and local school systems of the country furnish more than a thousand teachers to the camps, and about a thousand members of local communities near the camps also assist as instructors and leaders of educational activities.

Correspondence course materials are being supplied enrollees by scores of colleges and universities, State departments of education, and private institutions. More than 20,000 enrollees are taking such courses. Hundreds of camps near schools and colleges are invited to use the facilities of the institutions by school officials. This readi-

ness to cooperate has resulted in the attendance of more than 7,500 enrollees each month in nearby schools. Incomplete reports indicate that more than 6,000 men during the past year were awarded elementary, high-school, or college diplomas, while enrolled in the corps. One of the most tangible and heartening measurements of the effect of C. C. C. training is the fact that an average of 8,000 enrollees were discharged each month during the past year to accept employment.

LAND-GRANT COLLEGES AND UNIVERSITIES

The Secretary of the Interior is charged with the supervision of the expenditures of the Morrill funds and supplements for the support and endowment of the land-grant institutions. This work is delegated to the Office of Education.

Each State, including Alaska, Hawaii, and Puerto Rico, provides a land-grant college or university; Massachusetts provides 2, and each of the 17 Southern States provide a separate Negro land-grant college. The Federal endowment (act of 1862) raised from the sale of lands and land scrip amounted in 1936 to \$24,368,868, not including 662,281 acres of unsold land valued at \$5,005,468. The income from these funds totaled \$1,120,214 and was used mostly for faculty salaries.

The supplementary Morrill funds amounted to \$3,530,000, which were divided, \$70,000 to each State and Territory (except Alaska which received \$50,000). On and after 1938-39, the appropriation will be \$5,030,000 annually to the States.

The total amount of Federal funds received by the land-grant institutions in 1935-36 was about \$36,000,000. The value of the plants and properties of the land-grant colleges was nearly half a billion dollars (\$461,821,367).

Receipts from all sources reported by these 69 institutions amounted to \$165,924,249 of which 12.6 percent was from student fees; 3.5 percent endowment income; 20.0 percent Federal Government; 37.5 percent State government; 1.2 percent county or city government; 2.5 percent private gifts; 5.2 percent from sales and services; 13.0 percent from auxiliary enterprises; and 4.5 percent miscellaneous.

Expenditures amounted to \$158,326,063. These were paid out as follows: General administration 5.2 percent, resident instruction 35.4 percent, organized research 9.4 percent, extension 15.7 percent, libraries 2.0 percent, and operation and maintenance 7.5 percent, totaling 75 percent for educational and general purposes; auxiliary enterprises 12.2 percent, noneducational expense 2.1 percent, and capital outlays 9.6 percent.

A staff of 28,873 faculty members was employed to offer instruction to 209,455 students in residence work. About 20,000 students were taking correspondence courses, about 72,000 enrolled in extension

classes, and 53,000 in summer sessions. First degrees during the year were awarded to 28,946 students; 4,126 students received master's degrees, and doctor's degrees were conferred upon 852.

HOWARD UNIVERSITY REPORT

Howard University was inspected during the year by the Office of Education, as required by law. The annual report was compiled for presentation to Congress. For this annual report the president of the university assembled data according to a plan approved by the Office. These data constitute both the report to the Secretary of the Interior by the president of the university and the report to the Congress by the Office of Education.

Inasmuch as the annual report of the president of the university to the Secretary of the Interior is included in the Annual Report of the Secretary, no details concerning the university are given here.

VOCATIONAL EDUCATION

The cooperative program of vocational education carried on under the Smith-Hughes Act of 1917 and supplementary legislation, has two objectives. They are: (1) To prepare young persons for advantageous entrance into useful employment by equipping them with specific and tangible working assets, and (2) to give workers already employed the education they need to improve or maintain their employability or occupational status, or to regain their employability. Carried on not as a separate educational entity, but as a part of the public secondary school program, as provided under the enabling act, the vocational education program offers training to workers and prospective workers in agriculture, trade and industry, homemaking, and the distributive occupations.

The administration of the Federal Vocational Education Act, formerly the responsibility of the Federal Board for Vocational Education, is now vested in the Vocational Education Division of the Office of Education. In addition, the responsibility for administering the National Vocational Rehabilitation Act of 1920, which provides for the vocational restoration of persons disabled in industry and otherwise, training them where necessary and placing them in wage-earning employment, is also vested in the Vocational Division.

This report covers the twentieth year of Federal cooperation with the States in a country-wide program of vocational education, the seventeenth year of such cooperation in vocational rehabilitation, and the fourth year of the administration of these two programs by the Vocational Division of the Office of Education. In these two decades the enrollment in vocational schools has increased tenfold, and the number of disabled men and women who are being annually returned to self-supporting employment now equals approximately 10,000.

The vocational education and vocational rehabilitation acts now administered by the Office of Education are as follows:

The Vocational Education Act (Smith-Hughes), to provide for cooperation with the States in the promotion of vocational education. (Approved Feb. 23, 1917.)

The Vocational Rehabilitation Act, to provide for the promotion of vocational rehabilitation of persons disabled in industry or otherwise, and their return to employment. (Approved June 2, 1920, as amended June 5, 1924, June 9, 1930, and June 30, 1932.) Additional appropriations for 1936 and 1937 and annually thereafter for cooperating with the States and Hawaii in extending and strengthening their programs of vocational rehabilitation of the physically disabled, are authorized under the Social Security Act, approved August 14, 1935.

An act extending the benefits of the Vocational Education and Vocational Rehabilitation Acts to the Territory of Hawaii. (Approved Mar. 10, 1924.)

An act to provide for vocational rehabilitation of disabled residents of the District of Columbia. (Approved Feb. 23, 1929.)

An act extending the benefits of the Vocational Education and Vocational Rehabilitation Acts to the Island of Puerto Rico. (Approved Mar. 3, 1931.)

An act (George-Deen) to provide for the further development of vocational education in the several States and Territories, authorizing for the year 1937-38 and annually thereafter, additional appropriations for vocational education (approved June 8, 1936). This act continues authorization of additional appropriations upon expiration of the George-Ellzey Act of May 21, 1934, which authorized additional appropriations for the years 1935-37; and authorizes appropriations for vocational education in agriculture, trades and industries, home economics, the distributive occupations, and teacher training.

An act (Randolph-Sheppard) authorizing the operation of vending stands in Federal buildings by blind persons (approved June 30, 1936).

FEDERAL BOARD FOR VOCATIONAL EDUCATION

The Federal Board for Vocational Education created under the Smith-Hughes Act, to administer the provisions of the act, is composed of four members ex officio, as follows: The Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, and the Commissioner of Education; and three persons appointed by the President—one to represent agriculture, one to represent manufacturing and commerce, and one to represent labor.

The functions of the board were transferred to the Office of Education in 1933. As now constituted, the board acts in an advisory capacity, serving without compensation. Dr. Paul H. Nystrom, of New York, representing commerce and industry, is the chairman of the Board.

Two meetings of the Board were held during the past year, one in February and one in June. Among the problems which were considered and on which action was taken at these meetings are the following:

1. Policies of the Office of Education covering participation of State and local boards for vocational education in plant training programs for workers in trade and industrial occupations.

2. Use of State and local advisory committees composed of representatives of labor and industry, and of school administrators, in establishing and operating trade and industrial classes.

3. Need for study of teacher-training curricula insofar as they relate to vocational teachers.

TECHNICAL ADVISORY COMMITTEE

At the Fifty-fifth Annual Convention of the American Federation of Labor, held in Atlantic City, N. J., in October 1935, the committee on resolutions recommended that the convention "request the Federal Commissioner of Education to appoint a committee for the purpose of advising him in connection with all questions surrounding plant training." The resolutions committee recommended further that "this advisory committee consist of nine members, three to be outstanding representatives from the ranks of organized labor; three to be outstanding representatives of employers; and three to be recognized authorities in connection with State and local direction of vocational training."

Complying with the Federation's recommendation, the Commissioner of Education appointed a committee known as the Technical Advisory Committee on Trade and Industrial Education.

Through the efforts of this committee, a set of standards and safeguards to be followed by public vocational schools in determining whether they are justified in using Federal funds in establishing in private industrial plants vocational training programs in which instruction is given during the working day, was formulated and adopted. These standards and safeguards have been placed in effect by the Commissioner of Education as official policies governing assistance by State boards for vocational education in the establishment and operation of plant-training programs. A definite statement of this policy was incorporated in the revised edition of Bulletin 1, Statement of Policies for the Administration of Vocational Education, issued in February 1937.

The committee recommended that the Commissioner of Education urge upon State boards for vocational education the necessity for appointing State advisory committees, composed of equal representation of employers and labor, to advise them on matters pertaining to industrial training problems. A similar recommendation was made by the Technical Advisory Committee with respect to the establishment of local advisory committees on industrial education.

The committee has also devoted considerable time to the interpretation of certain phrases in Bulletin 1 and the extent to which the standards for plant-training programs should be applied.

POLICIES OF VOCATIONAL EDUCATION

The first statement of policies was incorporated in Bulletin 1 of the Federal Board for Vocational Education, issued in 1917. Changing conditions and the development of new problems through experience in the field necessitated a revision of this bulletin by the Federal Board in 1922 and again in 1926. During the past year the Office of Education made a fourth revision of the bulletin which reflects the policy changes that have been made since 1926, as a result of thorough consideration of the various problems in the field of vocational education.

The changes are based upon the experience gained in cooperating with the States in the development of the vocational education program over a period of 20 years and the criticisms and suggestions secured from representative groups and individuals engaged in and affected by the program of vocational education.

Among the individuals and groups from whom advice and counsel were solicited in revising the policies of the Office of Education are the following: State superintendents of public instruction, representatives of city school systems, State boards for vocational education, the American Home Economics Association, the American Vocational Association, representatives of labor and of employers, the Federal Advisory Board for Vocational Education, and the Technical Advisory Committee on General Policies, appointed by the Commissioner of Education, and members of the staff of the Office of Education.

Special attention was given in revising Bulletin 1 to the problems with which the States were confronted in formulating their general plans for the promotion of vocational education during the 5-year period beginning July 1, 1937, as required under the terms of the Smith-Hughes Act. It was necessary, also, to include in the revised statement of policies, new policies made necessary under the provisions of the George-Deen Act, which superseded the George-Ellzey Act, and which became effective July 1, 1937.

The Office of Education recognizes that as social and economic conditions change from time to time, it will probably be necessary to formulate new policies as needs arise. Any new policies or modifications of present policies thus made necessary will be issued as addenda to Bulletin 1.

Growth of Vocational Education and Vocational Rehabilitation Programs During the Year

A consistent growth has taken place in the vocational-education program carried on under Federal grants, since its establishment under the Smith-Hughes Act, in 1917, as evidenced by the increase in enrollment in vocational schools from year to year. Similarly, the growth of the vocational rehabilitation program may be measured by the

increase in the number of disabled persons rehabilitated since the inception of this program under the Federal Vocational Rehabilitation Act of 1920.

Enrollments in vocational schools operated under State plans, in agriculture, trade and industry, and home economics, increased from 164,123 in 1918 to 1,381,701 in 1936 and probably exceeded 1½ million for the fiscal year ending June 30, 1937.

Of the total number enrolled in 1936, 391,000 in round numbers were farmers, trade and industrial workers, and homemakers taking instruction in subjects related to their daily employment; 334,000 were youth employed in these three fields and attending part-time classes; and 656,000 were boys and girls attending full-time classes.

More than 10,300 persons disabled through accident, illness, or congenital causes were prepared for and placed in employment as self-supporting individuals in 1936, under the vocational rehabilitation program carried on in 45 States. This is an increase of more than 900 over 1935, and of 4,700 over 1933. In this particular it should be noted that the marked increase in the number rehabilitated during the past 3 years is attributable to supplementary Federal funds made available through the Federal Emergency Relief Administration and the Works Progress Administration, and more recently through the supplementary annual appropriation of \$841,000 provided under the National Security Act.

State reports for 1936 show that in addition to the 10,338 persons rehabilitated, 44,625 disabled persons in process of rehabilitation were being carried on the rolls at the close of the year.

Acceptance of Vocational Rehabilitation Acts by Kansas and Vermont

During the year, the legislatures of Kansas and Vermont accepted the terms of the National Vocational Rehabilitation Act of 1920, under which Federal grants for vocational rehabilitation are provided. Arrangements have been made to start the rehabilitation program in Vermont on July 1, 1938. The Kansas legislature, although it accepted the Federal act, did not provide funds for its operation. The inauguration of the program in that State, therefore, will be delayed until funds are appropriated for the purpose.

Cooperative Services to the States

Cooperative services to the States in the fields of vocational education and vocational rehabilitation, which is one of the chief functions of the Vocational Division of the Office of Education, cover a wide field.

Special attention has been given during the past year by the Vocational Division to assisting State vocational education administrators in formulating plans for the operation of programs of vocational educa-

tion for the 5 years, beginning July 1, 1937, so that they may conform to the provisions of the George-Deen Act and the revised interpretations of policy set up by the Office.

The Vocational Division has rendered similar services to the States, also, in the field of vocational rehabilitation. A brief statement of some of the services rendered by the Vocational Division in the several fields of vocational education and in the field of vocational rehabilitation is presented in the following paragraphs:

In the field of vocational agriculture.—In State conferences devoted to plans and programs for the ensuing 5-year period, special attention has been given to reemphasizing the primary aim of vocational agriculture—to train present and prospective farmers for proficiency in the production and marketing of farm products—as well as the contributory objectives—intelligent cooperation with others; establishment and maintenance of a satisfactory farm home; participation in worthy rural, civic, and social relationships; and the selection, purchase, use, and repair of power equipment on the farm. Continued emphasis has been placed upon farm practice activities which tend to increase the efficiency of the farm business and add to the happiness of the individual farmer.

Teacher-training institutions preparing young men to teach vocational agriculture have adjusted their programs with a view to training more teachers in anticipation of the expansion of the national program of vocational agriculture under the provisions of the George-Deen Act, effective July 1, 1937. Marked progress has been made in the improvement of the preemployment teacher-training programs maintained in 71 colleges and universities for the purpose of training white and Negro agricultural teachers.

The national organization known as the Future Farmers of America, composed of white boys studying vocational agriculture in the high schools of the country, and the New Farmers of America, a similar organization for Negro students, have continued to grow in numbers enrolled. Both organizations are sponsored by the Office of Education.

The 142,000 members of the Future Farmers of America are, through their 4,600 chapter organizations, learning to save systematically, and are getting experience in parliamentary procedure, public speaking, home beautification and repair, community activities, conservation of national resources, pest eradication, and cooperative activities such as purchasing and marketing of farm supplies and products.

Part of the time of one staff member of the agricultural education service is devoted to service as executive secretary of the Future Farmers of America, which, under the direction of State supervisors of agricultural education, is managed and operated by its officers and members.

In the New Farmers of America, principal emphasis during the year has been placed upon improving training in leadership. A manual similar to one followed by the Future Farmers of America is being prepared for the New Farmers of America and will be distributed to the membership at an early date.

In the field of trade and industry.—In addition to rendering assistance to State boards for vocational education in setting up State plans for the next 5 years, aiding them in promoting various types of trade and industrial education, inspecting and evaluating existing programs, auditing vocational education accounts, and exercising the regular supervisory functions, the trade and industrial education service has carried on numerous other activities, including State and local surveys of vocational education needs and investigations bearing upon the organization and operation of effective programs, carried on by field agents. Assistance was given in training leaders for an educational program in connection with the industries of the bay region of California, in a training program for Texas peace officers, in training for drillmasters of fire departments in Connecticut, in training for textile workers in Pennsylvania, in mapping vocational curriculum and building needs for the industrial area of West Virginia, in training conferences for coordinators of industrial education programs in 7 States, in summer teacher-training conferences in 11 States; in programs of training for public service in 5 States, sponsored by State municipal leagues; cooperation with State departments of education, local boards of education, and architects in mapping plans for building and equipment for new vocational schools in 7 States; with the International Brickmasons and Plasterers Union in studying existing programs of training for brickmasons and plasterers in 3 States, with State public health officials of Texas in training local health department inspectors and school custodians, in a survey of the industrial teacher-training programs in Colorado, in a survey of vocational education needs in Iowa, in a survey of training needs in the cities of Chattanooga and Knoxville, and in a program designed to prepare teachers of nurses' training courses sponsored by State boards of nurses' examiners in Minnesota and Pennsylvania.

In the field of home economics.—The usual number of regional and interstate conferences have been held and a large number of individual conferences with directors of vocational education, supervisors, and teacher trainers of home-economics education have been carried out. Particular attention has been directed to the issuing of materials on organization and administration.

Staff members planned and participated in a short, intensive training course for itinerant teacher trainers for Negro schools; participated in State conferences for home-economics teachers in 5 States; offered special short courses in summer schools of 6 teacher-training institutions; conducted 8 interstate conferences (2 for representatives from Negro

teacher-training institutions and State supervisors); participated in plans for special family-life institutes at 6 teacher-training institutions; conducted studies of teacher-education programs in 22 institutions in 8 States; called and participated in a national conference on home management for college instructors in home economics to consider kinds of family life and community experiences students should have as a part of their home-management work; conducted a conference called by the State department of education in 1 State for presidents, heads of home-economics departments, and teacher trainers in all colleges of the State to consider the State-wide program in home economics; assisted in home-economics curriculum-building programs for public schools in a number of States and advised in revision of college and university programs for the preparation of home-economics teachers; provided special programs of interest to city supervisors of home economics in connection with 2 regional conferences; and worked with 2 agricultural groups in 2 regions in planning programs to improve farm-family living.

In the field of commercial education.—Preparations have been made by many of the States in the past year for starting courses for employees in the distributive occupations—those involved in getting the products of factories and farms to the consumer—as authorized under the George-Deen Act approved June 8, 1936, and effective July 1, 1937. Much of the time of the commercial-education service during the past year, therefore, has been devoted to assisting the States in securing information concerning the educational needs of the groups of workers in the distributive occupations, and in planning effective instructional programs for these groups as well as for those who must be trained as teachers of distributive occupational subjects.

Particular attention was given to aiding State boards for vocational education in outlining the kinds of classes for teaching distributive occupational subjects so that they might be in a position to include this information in their State plans for the 5-year period beginning July 1, 1937.

The Office has conferred with several commercial trade associations, notably the National Association of Retail Grocers, the National Association of Retail Meat Dealers, and organizations representing retail department stores, in regard to organizing educational committees to work with the Office of Education and with State vocational education administrators in developing a program of vocational education for workers represented by these associations.

Considerable time has been devoted to assisting secondary schools in adjusting commercial courses and curriculums to present-day commercial-employment opportunities and requirements for high-school commercial graduates.

Assistance was also given the Maryland State Board for Vocational Education in revising the State course of study in commercial subjects used in Maryland high schools. Similar help also was given the revision committee of the Pittsburgh public schools, and the Philadelphia schools received aid in revising a course in salesmanship.

In the field of vocational rehabilitation.—Eight principal services were rendered during the year by the Office of Education to State boards for vocational rehabilitation and local rehabilitation officials, assisting in the following ways:

1. Training new personnel.
2. Organizing rehabilitation case record systems.
3. Expanding State rehabilitation services.
4. Organizing and conducting studies of special phases of rehabilitation service.
5. Developing cooperative relations with welfare and similar organizations in carrying on rehabilitation activities.
6. General promotion of State programs of rehabilitation.
7. Expanding cooperation in rehabilitation work by employees of other State services.
8. Conducting conferences of State staff members.

During the past year detailed surveys of vocational rehabilitation programs were made in the States of Ohio, West Virginia, Indiana, and Oklahoma.

Cooperation With Other Agencies

The necessity for cooperating with governmental and other public and private agencies whose activities and objectives dovetail to some degree with the programs of vocational education and vocational rehabilitation, carried on under Federal grants, has been recognized by those responsible for the promotion of these programs ever since their inception.

The economic and social conditions of the past few years, during which a number of emergency organizations with functions allied to vocational education have been established, have served to emphasize to an even greater degree the importance of such cooperation.

In the field of agricultural education the Vocational Division has cooperated with various farmer organizations such as the Grange and the Farm Bureau; it has continued to cooperate with such Government agencies as the Farm Credit Administration, the Soil Conservation Division, and the Agricultural Adjustment Administration, in preparing subject matter designed to keep farm boys and farmers informed as to the service they may obtain from these organizations.

The Vocational Division has sought the help of these various outside agencies, also, in solving some of its own problems, especially in the field of research, and in preparing bulletins and other materials for use in different fields of trade and industrial training. In this rela-

tionship, the trade and industrial service has cooperated during the year with the following organizations:

American Municipal Association; Gypsum Industries Association; International Association of Chiefs of Police; International Association of Fire Chiefs; International Society of Master Painters and Decorators; League of New Hampshire Arts and Crafts; Metal Lath Association; National Occupational Conference; National Federation of Business and Professional Women's Clubs; National Committee on Prisons and Prison Labor; National Council for Household Employment; National Association of State Boards of Examiners in Cosmetology; National Association of University Women; National Association of Hotels and Restaurants of the United States and Canada; National League of Nursing Education; Portland Cement Association; Southern Women's Educational Alliance; Southern Mountain Workers Guild; and Structural Clay Products Institute.

The cooperation of the Division with Government and with other agencies in the field of home-economics education may be summarized as follows: Joint study with Home Economics Extension Service, United States Department of Agriculture, on methods of meeting local needs for home-economics education and assistance in nutrition programs in drought areas; cooperation with Rural Resettlement Administration, Tennessee Valley Authority, Rural Electrification Administration, and Works Progress Administration; assistance to Interdepartmental Committee of Federal Government in coordinating health and welfare activities; and participation in conferences with Children's Bureau, United States Department of Labor, American Home Economics Association, National Council of Parents and Teachers, American Youth Commission, National Council of Parent Education, American Vocational Association, National Education Association, Association of Southern Agricultural Workers, National Consumer-Relations Council, and National Committee on Household Employment.

Working relations with Federal and State agencies with which cooperation is required by law, and with other National, State, and local agencies which are in position to aid in the program of vocational rehabilitation, have been materially strengthened during the year. In several States and the District of Columbia a coordinated program for the placement of the handicapped was put into effect.

Under the provisions of the Randolph-Sheppard Act, authorizing the operation of vending stands in public buildings by blind persons, cooperative relations have been established with State commissions for the blind and other agencies in position to assist in this blind-employment movement. During the year 24 States were authorized to set up programs under which blind persons are employed as attendants in vending stands in Federal and other buildings, and approxi-

mately 100 such stands are in operation. Through such efforts increased use is being made by State rehabilitation departments of the services available from workmen's compensation bureaus, State employment bureaus, hospitals, and numerous welfare agencies in carrying on vocational rehabilitation activities.

Contribution to Education in C. C. C. Camps

Reports to the Office of Education indicate that States and local communities are making their vocational education programs available to enrollees in Civilian Conservation Corps camps to a considerable degree. Twenty-three States have organized classes, especially for these enrollees. In 27 States enrollees are attending classes in nearby vocational schools. Eighteen States report that they have conducted group conferences for educational advisers, leaders, and camp commanders, for the purpose of training them in conference-leading, teacher-training, and foremanship activities. Special services have been given in 10 States in planning and organizing instructional material for use in camp educational programs. Staff members of the Vocational Division have assisted the educational division of the Civilian Conservation Corps in a similar way.

Research Activities

Following the policy inaugurated when the program of Federal cooperation with the States in the promotion of vocational education was started in 1917, definite and specific "studies and investigations" in this field, provided for under the Smith-Hughes Act, have been carried on during the past year. The following list indicates a few of such studies: The occupational status and progress of former vocational-agriculture students; subject matter material in the fields of farm management, farm production, and the marketing of farm products; teacher training; amount and distribution of time devoted to vocational agriculture in high schools; analyses of State plans for vocational education in agriculture; training for, and occupations of, out-of-school farm youth; potential departments of vocational agriculture in high schools; supervised farm-practice programs; training for the fields of painting and decorating, plastering, metal lathing and bricklaying, sheet metal work in the aviation industry, railway and shipyard machine-shop practice, fire and police protection, and other public-service occupations; home economics at the college and high-school levels; teaching of home-management; housing as a part of home-economics programs; education for household employment; homemaking needs of out-of-school youth and adults; service occupations for which home-economics education prepares girls.

Research activities in the commercial-education field were confined largely to gathering and distributing information to State boards for

vocational education, and to organizations representing those engaged in the distributive occupations, on the need for training and on possible training programs in this field.

In addition to the surveys of State programs of rehabilitation made in Ohio, West Virginia, Indiana, and Oklahoma, the Rehabilitation Service has prepared and published a series of 10 job analyses for use in supervising disabled persons under training for specific occupations.

Data from reports covering more than 10,000 persons rehabilitated in various States were tabulated and distributed to those who could make use of such material in rehabilitation work.

New Developments

Perhaps the most significant new development in vocational education during the year was the preparation under way in the States to take advantage of the provisions of the George-Deen Act, effective July 1, 1937, under which training is to be given in part-time and evening classes for those engaged in the distributive occupations—wholesaling, retailing, and other merchandising operations. Approximately one of every six workers gainfully employed in the United States is engaged in a distributive occupation.

Greater emphasis upon plans for programs of training for public-service occupations, and in the eastern section of the United States upon what may be termed general training in specific fields as compared with specific training covering a single trade as typified by the unit trade school, are among the new developments in the field of trade and industrial education.

Considerable attention has been given to plans for training in public-service occupations. During the year many of the States have made plans for training in a wide range of such occupations, including police- and fire-protection work, public-sanitation work, weights and measures inspection, water-works operation, municipal lighting, milk and meat inspection, and other nonclerical occupations involved in the operation of modern municipalities.

The program of the Public Employment Division of the United States Department of Labor, the public-health program administered by the Public Health Service, the program for crippled children administered by the Children's Bureau of the Department of Labor, and the unemployment compensation provision of the Social Security Act have made necessary a closer correlation in the States of the rehabilitation service with the four fields listed. During the year satisfactory progress has been made by the Office of Education in its efforts to correlate the programs of rehabilitation carried on in the States with the programs of these allied agencies.

Of special significance is an arrangement made under the sponsorship of the Office of Education, whereby the executive committee of

the newly created States Rehabilitation Council, composed of State rehabilitation officials and workers, will function as a technical advisory committee to the Office, in the field of vocational rehabilitation. This executive committee of the council will, upon invitation of the Commissioner of Education, meet from time to time with representatives of the Office of Education to discuss developments in the vocational-rehabilitation program and to suggest means of improving this program, through the adoption of new Federal policies.

Apprentice Training

The program of apprentice training carried on under the terms of the Smith-Hughes Act has been materially strengthened and the possibility of duplication of this program eliminated through an agreement with the Federal Committee on Apprentice Training, under which the responsibilities of the committee and the Office of Education have been definitely allocated.

Under this cooperative relationship the committee assists the States in the promotion of appropriate legislation on apprenticeship and the Office of Education assumes responsibility for sponsoring educational programs of training for apprentices, in cooperation with State boards for vocational education. This training program calls for the selection and training of special teachers for apprentice groups and the selection and training of coordinators, in order that the work experience and school training of apprentices may be brought into proper relationship. It also calls for the preparation of analyses of specific trades and of training plans, and of outlines for the teaching of technical subjects, and the adaption of subject matter to meet the special needs of apprentices in a wide variety of trades and crafts.

During the year staff members of the Vocational Division of the Office of Education conducted an 18-day conference on apprentice training in cooperation with a steel corporation, the Illinois and Indiana State boards for vocational education, and the boards of education of Chicago and Gary.

Publications

Each year reports of annual regional conferences arranged and conducted by regional agents in the three fields of vocational education—agriculture, trade and industry, home economics—and in vocational rehabilitation, are mimeographed and distributed to those interested in using them as reference material. Such reports were issued in 1936-37 as usual. In addition the following printed and mimeographed publications, a number of which grew out of studies and investigations, were issued and distributed:

General

Digest of Annual Reports of State Boards for Vocational Education to the Office of Education, Division of Vocational Education, for the year ended June 30, 1936.

Agricultural Education

Bulletin 154, Analyses of Special Jobs in Quality Milk Production, revised 1937.
Bulletin 191, Interpretive Science and Related Information in Vocational Agriculture.

Misc. 1851. Vocational Agriculture Service Map.

Misc. 1880. Supplementary Farm Practices.

C. L. No. 2015. Importance of Follow-up.

F. F. A. Service Letter No. 138. Summary of the Ninth National Convention of Future Farmers of America.

Trade and Industrial Education

Bulletin 185. Aviation in the Public Schools.

Misc. 1853. National Conference on Trade and Industrial Education.

Home Economics Education

Bulletin 187. Home Economics Education Courses.

Misc. 1822. The Forward Look for the Committee on Cooperation.

Misc. 1859. Selected List of Books, Pamphlets, and Periodicals on Vocations
Toward Which Home Economics Training Makes a Contribution.

Misc. 1860. Publications Concerning Minority Groups.

Misc. 1861. Source Material on Negro Life and Education.

Misc. 1867. Suggested References on Consumer Education.

Misc. 1873. Planning the Family Expenditures.

Misc. 1884. Suggestive Materials for the Teaching of Housing in Home Economics Programs.

Misc. 1907. The Status of In-Service Training of Home Economics Teachers in the United States in 1934.

Misc. 1910. Illustrations of Tests for Evaluating Instruction in Some Phases of Consumer Buying.

Misc. 1928. Organization and Administration, Home Economics Education (preliminary draft, May 1937, of Bulletin No. 28, revised).

Commercial Education

Bulletin 186. Cooperative Training in Retail Selling in the Public Secondary Schools.

Vocational Rehabilitation

Leaflet No. 5. Restoring the Handicapped to Useful Employment.

A Statistical Study of Disabled Persons Rehabilitated 1935-36.

A Study of the Rehabilitation of One-Armed Persons.

A Study of Rehabilitated Persons Disabled Through Employment Accidents.

An Analysis of Types of Training Given Rehabilitated Persons.

A Statistical Study of the Rehabilitation of Persons Disabled by Tuberculosis and Heart Disease.

A Study of Persons Rehabilitated Through Training in Commercial Occupations.

Analyses of Seven Jobs in Which the Handicapped Can Be Trained.

Appropriations: 1937 and 1938

Appropriations for administering the vocational-education program carried on under Federal funds for the fiscal year ended June 30, 1937, totaled \$265,000—\$192,000 under the Smith-Hughes Act and \$73,000 under the George-Ellzey Act. The George-Ellzey Act expired June 30, 1937, and was superseded by the George-Deen Act, which authorized increased appropriations for allotment to the States and for administrative expenses. For the fiscal year ending June 30, 1938, Congress appropriated \$425,000 for the administration of the Smith-Hughes and George-Deen Acts. The appropriation for administering the Federal vocational-rehabilitation acts was increased from \$78,420 for the fiscal year ended June 30, 1937, to \$95,000 for the year ending June 30, 1938, the increase providing principally for additional personnel required in the administration of the Randolph-Sheppard Act making provision for the establishment of vending stands for blind persons.

The Smith-Hughes Act appropriates \$7,167,000 annually for allotment to the States for cooperative vocational education in agriculture, trades and industries, and teacher training. The total amount authorized in the George-Deen Act of \$14,483,000 was appropriated for 1938, an increase of more than \$10,000,000 over the amount authorized in the George-Ellzey Act, which expired on June 30, 1937. Appropriations for vocational education in Hawaii and Puerto Rico are continued in the same amounts for 1938 as for 1937.

The appropriation to the States for 1937 under the Vocational Rehabilitation Act of June 2, 1920, as amended, was in the amount of \$1,891,000, and for 1938, \$1,800,000. Continued appropriations in the total amount authorized are provided for vocational rehabilitation in Hawaii and Puerto Rico. The appropriation for rehabilitation in the District of Columbia is increased from \$15,000 for 1937 to \$25,000 for 1938, in accordance with an amending act.

The acts authorizing appropriations for allotment to the States for vocational education and rehabilitation provide that unexpended balances remaining in the States at the close of a fiscal year shall be deducted from the allotments to those States for the ensuing year. Appropriations made in consideration of the unexpended balances provide that the allotments to the States shall be made on the basis of the total amounts authorized in the acts.

Appropriations for allotment to the States and Territories are shown in table I, total allotments to the States and Territories for vocational education in table II; and allotments for vocational rehabilitation in table III.

TABLE 1.—Appropriations for Allotment to the States and Territories for Vocational Education and Vocational Rehabilitation: 1937, 1938

Act	Appropriation	
	Fiscal year ending June 1937	Fiscal year ending June 1938
VOCATIONAL EDUCATION		
Smith-Hughes Act:		
Total.....	¹ \$7,167,000.00	¹ \$7,167,000.0
Vocational agriculture.....	3,027,000.00	3,027,000.00
Vocational trade, industry, and home economics.....	3,050,000.00	3,050,000.00
Vocational teacher training.....	1,090,000.00	1,090,000.00
George-Elzey Act (expired June 30, 1937):		
Total.....	² 3,000,000.00	-----
Vocational agriculture.....	1,000,000.00	-----
Vocational trade and industry.....	992,207.84	-----
Vocational home economics.....	1,007,792.16	-----
George-Deen Act (effective July 1, 1937):		
Total.....	-----	14,483,000.00
Vocational agriculture.....	-----	4,067,200.00
Vocational trade and industry.....	-----	4,058,975.00
Vocational home economics.....	-----	4,048,825.00
Distributive occupations.....	-----	1,254,000.00
Vocational teacher training.....	-----	1,054,000.00
An act making appropriations for the Territory of Hawaii:		
Total.....	30,000.00	30,000.00
Vocational agriculture.....	10,000.00	10,000.00
Vocational trade, industry, and home economics.....	10,000.00	10,000.00
Vocational teacher training.....	10,000.00	10,000.00
An act making appropriations for the Island of Puerto Rico:		
Total.....	105,000.00	105,000.00
Vocational agriculture.....	30,000.00	30,000.00
Vocational trade and industry.....	30,000.00	30,000.00
Vocational home economics.....	30,000.00	30,000.00
Vocational teacher training.....	15,000.00	15,000.00
Total, vocational education.....	10,302,000.00	21,785,000.00
VOCATIONAL REHABILITATION		
Vocational Rehabilitation Act.....	1,891,000.00	1,800,000.00
Hawaii.....	5,000.00	5,000.00
Puerto Rico.....	15,000.00	15,000.00
District of Columbia.....	15,000.00	25,000.00
Total, vocational rehabilitation.....	1,926,000.00	1,845,000.00
Total, vocational education and vocational rehabilitation.....	12,228,000.00	23,630,000.00

¹ Permanent and continuing appropriation. Estimated expenditure \$7,000,000.² Allotments to States made on basis of \$3,084,603 as authorized in the act.

TABLE 2.—Allotments of Federal money to the States and Territories for vocational education, year ending June 30, 1938

State or Territory	Smith-Hughes Act				George-Deen Act					
	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational home-economics education	Vocational education for distributive occupations	Vocational teacher training
Total.....	\$7,157,977.62	\$3,018,853.83	\$3,049,265.27	\$1,089,858.52	\$14,483,000.00	\$4,097,200.00	\$4,058,975.00	\$4,048,825.00	\$1,254,000.00	\$1,054,000.00
Alabama.....	160,268.82	106,018.23	32,611.15	21,039.44	401,144.05	165,947.24	55,072.91	135,856.98	24,429.46	19,837.46
Arizona.....	35,926.19	15,926.19	10,000.00	10,000.00	80,408.60	20,000.00	20,000.00	20,408.60	10,000.00	10,000.00
Arkansas.....	313,266.41	82,028.87	16,776.23	15,164.85	305,740.84	138,607.14	305,740.84	105,115.82	17,120.09	13,902.02
California.....	81,540.06	28,757.35	182,301.17	46,425.18	493,375.58	76,828.34	213,243.37	108,333.79	52,410.87	42,559.21
Colorado.....	61,536.56	28,757.35	22,779.21	10,000.00	123,622.04	35,018.40	31,752.56	36,851.08	10,000.00	10,000.00
Connecticut.....	89,214.52	26,484.45	49,589.77	13,140.30	144,923.17	20,000.00	64,104.14	33,938.47	14,834.50	12,046.06
Delaware.....	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Florida.....	84,735.54	39,488.86	33,290.52	12,006.16	159,855.59	34,542.21	50,149.93	50,602.96	13,553.13	11,006.36
Georgia.....	175,228.68	112,207.67	39,236.98	23,784.03	430,909.73	173,634.20	62,833.09	143,788.43	26,850.55	21,803.46
Idaho.....	37,587.72	11,587.72	10,000.00	10,000.00	85,800.29	23,322.53	20,000.00	22,537.76	10,000.00	10,000.00
Illinois.....	420,534.11	111,199.48	246,923.68	62,398.95	673,513.01	123,722.64	279,646.92	142,496.48	70,444.17	57,202.79
Indiana.....	186,584.34	80,412.77	78,689.02	26,482.55	360,165.48	100,662.97	102,283.38	103,044.87	28,897.00	24,277.26
Iowa.....	146,260.73	83,146.09	42,908.77	20,205.87	331,923.17	121,080.05	62,991.33	106,547.48	22,811.05	18,523.26
Kansas.....	111,527.42	64,167.24	31,978.49	15,381.69	250,754.04	87,561.92	49,499.38	82,227.05	17,364.88	14,100.81
Kentucky.....	157,592.30	101,201.53	35,010.22	21,380.55	379,737.33	145,672.06	60,643.33	129,684.62	24,137.19	19,600.13
Louisiana.....	124,300.87	70,683.15	36,522.14	17,185.58	282,172.30	102,842.00	53,597.61	90,576.86	19,401.35	15,754.48
Maine.....	50,615.30	26,528.15	14,987.15	10,000.00	101,582.84	21,171.85	26,416.52	33,994.47	10,000.00	10,000.00
Maryland.....	92,659.43	36,602.80	47,714.98	13,341.65	162,385.90	29,400.76	58,788.05	46,904.63	15,061.81	12,230.65
Massachusetts.....	225,039.31	23,310.27	167,878.22	34,750.82	294,968.15	20,000.00	174,008.92	29,870.92	39,231.31	31,857.00
Michigan.....	270,137.03	85,855.27	144,684.11	39,597.65	459,102.70	96,872.60	171,207.64	110,019.17	44,703.06	36,300.23
Minnesota.....	148,887.03	72,816.70	55,103.85	20,966.48	317,424.54	110,858.20	70,865.18	93,310.90	23,669.73	19,220.53
Mississippi.....	204,424.02	93,141.81	14,847.09	16,435.12	349,001.51	168,741.26	27,283.12	139,356.49	18,554.13	15,066.51
Missouri.....	209,813.81	98,675.62	81,459.38	29,678.81	431,203.86	137,960.54	106,052.83	126,447.79	33,505.35	27,207.35
Montana.....	39,875.61	19,875.61	10,000.00	10,000.00	90,801.51	25,331.93	20,000.00	25,469.58	10,000.00	10,000.00
Nebraska.....	82,280.54	49,713.06	21,299.32	11,268.16	192,684.27	25,518.94	33,409.76	63,704.76	12,720.99	10,329.82
Nevada.....	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
New Hampshire.....	37,679.49	10,714.23	11,965.26	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
New Jersey.....	218,405.63	39,135.29	146,312.71	33,047.63	302,649.11	20,000.00	164,895.07	50,149.88	37,308.52	30,295.64
New Mexico.....	37,642.12	17,642.12	10,000.00	10,000.00	82,607.48	20,000.00	20,000.00	22,607.48	10,000.00	10,000.00
New York.....	679,136.35	115,167.53	461,031.10	102,937.72	947,775.59	89,138.46	500,480.36	147,581.33	116,209.68	94,365.76
North Carolina.....	192,981.96	131,572.98	35,484.35	25,424.63	485,954.01	198,094.85	66,222.13	168,604.08	29,297.15	23,765.90
North Dakota.....	51,635.26	31,635.26	10,000.00	10,000.00	129,730.19	49,191.21	20,000.00	40,538.98	10,000.00	10,000.00

1 The allotments to Hawaii and Puerto Rico are not included in the totals under the Smith-Hughes Act.

TABLE 2.—Allotment of Federal money to the States and Territories for vocational education, year ending June 30, 1938—Continued

State or Territory	Smith-Hughes Act				George-Deen Act					
	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational teacher training	Total	Vocational agricultural education	Vocational trade, industrial, and home-economics education	Vocational home-economics education	Vocational education for distributive occupations	Vocational teacher training
Ohio.....	\$371,096.69	\$119,248.45	\$197,495.50	\$54,352.74	\$627,015.40	\$125,453.59	\$237,563.83	\$152,810.82	\$61,360.55	\$49,826.61
Oklahoma.....	143,332.81	87,756.55	36,002.87	19,593.39	337,188.90	126,795.87	57,856.10	112,455.55	22,119.60	17,961.78
Oregon.....	57,324.88	25,866.11	21,458.77	10,000.00	111,628.76	27,693.47	30,789.18	33,146.11	10,000.00	10,000.00
Pennsylvania.....	537,700.58	172,677.04	286,273.09	78,759.45	858,491.92	106,072.11	370,028.00	221,276.85	88,914.06	72,200.90
Rhode Island.....	47,842.03	10,000.00	27,842.03	10,000.00	88,296.57	20,000.00	28,296.97	20,000.00	10,000.00	10,000.00
South Carolina.....	106,714.19	76,236.31	16,259.29	14,218.59	274,928.97	113,473.43	34,676.21	97,692.95	16,051.82	13,034.56
South Dakota.....	51,323.28	31,323.28	10,000.00	10,000.00	128,452.67	48,313.48	59,084.68	40,139.19	10,000.00	10,000.00
Tennessee.....	156,555.22	95,875.76	39,282.82	21,395.64	376,206.74	150,491.95	59,084.68	122,859.80	24,155.35	19,614.87
Texas.....	343,814.26	191,491.24	104,691.96	47,631.06	780,504.42	291,248.04	146,433.22	245,386.28	53,772.22	43,664.66
Utah.....	35,132.76	13,465.11	11,666.65	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Vermont.....	33,424.97	13,424.97	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Virginia.....	145,433.63	91,209.99	34,419.18	19,804.46	337,148.87	117,718.58	62,036.16	116,880.97	22,357.83	18,155.27
Washington.....	89,381.85	37,840.26	38,757.07	12,784.52	165,432.09	37,731.20	53,077.76	48,490.36	14,432.86	11,719.91
West Virginia.....	104,667.06	68,990.85	21,535.80	14,140.41	226,923.00	55,037.33	83,981.55	88,408.27	15,963.56	12,962.89
Wisconsin.....	169,327.36	77,210.55	68,083.37	24,033.44	343,977.87	109,088.25	86,784.01	98,941.39	27,132.12	22,032.10
Wyoming.....	30,000.00	10,000.00	10,000.00	10,000.00	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Alaska.....	-----	-----	-----	-----	80,000.00	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
District of Columbia.....	-----	-----	-----	-----	80,512.97	20,000.00	20,512.97	20,000.00	10,000.00	10,000.00
Hawaii.....	-----	-----	-----	-----	80,020.99	20,000.00	20,000.00	20,000.00	10,000.00	10,000.00
Puerto Rico.....	-----	-----	-----	-----	254,271.99	126,739.41	21,941.06	79,764.66	14,253.90	11,573.86

TABLE 3.—Allotments of Federal Money to the States and Territories for Vocational Rehabilitation, Fiscal Years Ending June 30, 1937 and 1938

State or Territory	1937	1938	State or Territory	1937	1938
Total	\$1,885,009.61	\$1,938,000.00	Nevada.....	10,000.00	10,000.00
Alabama.....	39,730.02	40,912.77	New Hampshire.....	10,000.00	10,000.00
Arizona.....	10,000.00	10,000.00	New Jersey.....	60,675.45	62,481.73
Arkansas.....	27,842.67	28,671.54	New Mexico.....	10,000.00	10,000.00
California.....	85,236.63	87,774.11	New York.....	188,993.65	194,619.94
Colorado.....	15,551.07	16,014.02	North Carolina.....	47,597.62	49,014.59
Connecticut.....	24,125.59	24,843.80	North Dakota.....	10,222.02	10,526.32
Delaware.....	10,000.00	10,000.00	Ohio.....	99,791.63	102,762.39
Florida.....	22,043.31	22,699.53	Oklahoma.....	35,973.47	37,044.38
Georgia.....	43,667.48	44,967.45	Oregon.....	14,319.87	14,746.17
Idaho.....	10,000.00	10,000.00	Pennsylvania.....	144,602.35	148,907.13
Illinois.....	114,564.47	117,975.03	Rhode Island.....	10,321.88	10,629.16
Indiana.....	48,621.96	50,069.43	South Carolina.....	26,105.33	26,882.47
Iowa.....	37,097.98	38,202.37	South Dakota.....	10,402.24	10,711.91
Kansas.....	28,240.79	29,081.51	Tennessee.....	39,284.23	40,453.71
Kentucky.....	39,254.69	40,423.30	Texas.....	87,450.62	90,054.00
Louisiana.....	31,552.72	32,492.04	Utah.....	10,000.00	10,000.00
Maine.....	11,972.28	12,328.69	Vermont.....	10,000.00	10,000.00
Maryland.....	24,495.27	25,224.49	Virginia.....	36,360.99	37,443.44
Massachusetts.....	63,802.50	65,701.88	Washington.....	23,472.38	24,171.15
Michigan.....	72,701.29	74,865.59	West Virginia.....	25,961.79	26,734.67
Minnesota.....	38,494.46	39,640.43	Wisconsin.....	44,125.40	45,439.00
Mississippi.....	30,174.88	31,073.18	Wyoming.....	10,000.00	10,000.00
Missouri.....	54,490.29	56,112.45	Hawaii.....	10,000.00	10,000.00
Montana.....	10,000.00	10,000.00	District of Columbia.....	15,000.00	25,000.00
Nebraska.....	20,688.34	21,304.23	Puerto Rico.....	15,000.00	15,000.00

¹ A special allotment of \$5,000 to Hawaii and the allotment to the District of Columbia and the island of Puerto Rico are not included in the total.

GENERAL EDUCATION BOARD

This corporation, which was created by an act of Congress approved January 12, 1903, section 6 of which requires the corporation to file annually with the Secretary of the Interior a report, in writing, stating in detail the property, real and personal, held by the corporation, and the expenditure or other use or disposition of the same or the income thereof during the preceding year, has for its object the promotion of education within the United States.

The bylaws, as amended at the annual meeting of the members and trustees held December 17, 1936, provide that the fiscal year shall commence the 1st day of January in each year and end on the following 31st day of December. Accordingly there is presented herewith a report for the 6-month period July 1 to December 31, 1936.

On June 30, 1936, principal fund, belonging without restriction to the board, amounted to \$34,734,598.42. Transactions during the period resulted in a net increase of \$4,181,447.82, or a balance December 31, 1936, of \$38,916,046.24. This fund is invested in stocks and bonds. In addition, the sum of \$14,486,380.95 is reserved to pay appropriations to various educational institutions, and the further sum of \$746,500 has been referred to the executive committee for appropriation, a total sum reserved of \$15,232,880.95. This fund is invested as follows: Securities, \$13,186,621.78, and cash on deposit, \$1,299,759.17. Lapses and refunds on prior years' appropriations amounted to \$273,000 and \$1,500, respectively, and the further sum

of \$2,750,000 previously authorized, was rescinded. Payments during the 6-month period amounted to \$1,856,100.96.

There was appropriated from income during the 6-month period the sum of \$1,045,834. Lapses on account of prior years' appropriations amounted to \$298,353.54, however, leaving a net increase in income appropriations of \$747,480.46.

The income from the above funds, together with income from undisbursed income, amounted during the period to \$1,146,108.92; the balance of income from the previous year as of June 30, 1936, amounted to \$8,688,467.05, which, together with sundry refunds amounting to \$2,841.40, increased the total to \$9,837,417.37. Disbursements from income during the 6-month period amounted to \$1,604,928.49, leaving an undisbursed balance of income on December 31, 1936, of \$8,232,488.88. Of this sum, \$7,899,641.44 is in cash on deposit and \$332,847.44 in sums advanced on account of appropriations which are to be accounted for. This balance of \$8,232,488.88 consists of: Unpaid appropriations, \$6,874,749.37; amount referred to the executive committee for appropriation, \$603,690; and the sum of \$754,049.51 which remains unappropriated.

The Anna T. Jeanes fund, the principal and interest of which are to be used for Negro rural schools, amounted, on December 31, 1936, to \$15,919.21. The sum of \$25,000 was appropriated during the period, of which the sum of \$12,500 was paid. The unpaid balance of \$12,500 is in cash on deposit.

The balance in the Anna T. Jeanes fund income account at June 30, 1936, amounted to \$2,334.49. There was no income during the period and payments amounting to \$1,110.99 reduced this balance to \$1,223.50, which consists of unpaid appropriations of \$875 and an unappropriated balance of \$348.50. The total sum of \$1,223.50 is in cash on deposit.

MARCH 1, 1937.

DIVISION OF TERRITORIES AND ISLAND POSSESSIONS

Ernest H. Gruening, *Director*

THE Division of Territories and Island Possessions, in addition to the regular administrative functions of coordinating and supervising the activities under its jurisdiction, has assumed a large volume of budgetary and accounting work relating to the Territories and possessions, including the governments of Alaska, Hawaii, Puerto Rico, and the Virgin Islands; also The Alaska Railroad, Alaska Road Commission, Alaska Insane, The Virgin Islands Company; and the colonization projects on Howland, Baker, and Jarvis Islands.

The Division has made considerable progress in furthering the interests of these outlying areas and activities of the United States as they relate to the other Departments and agencies of the Federal Government, and many appearances were made during the fiscal year before the Bureau of the Budget, congressional committees, etc., in behalf of appropriations, legislation, and other administrative matters of importance. The Director of the Division made a number of trips to Puerto Rico and the Virgin Islands during the year, and the administrative officer visited the Hawaiian Islands to inspect the Homes Commission projects, territorial institutions, etc., and to organize and despatch the first expeditionary cruise under the Department of the Interior to Howland, Baker, and Jarvis Islands for the purpose of establishing and maintaining permanent colonization projects thereon. These islands are located in the Pacific Ocean on the Equator, approximately south of Hawaii, and groups of four Hawaiian-American citizens are maintained on each for the purpose of preserving United States sovereignty and obtaining certain meteorological material considered to be of value in connection with the proposed establishment of air routes to the Southern Hemisphere. The administrative officer also visited the Morningside Hospital, Portland, Oreg., where the Alaska insane patients are cared for under contract with the Federal Government.

Through these personal relationships and the use of the Federal Government's radio system and the commercial air facilities, the Division has maintained close communication with the distant and widely diversified activities under its supervision.

TERRITORY OF ALASKA

During 1937 the administrative functions of the Department in connection with the office of Governor of Alaska, The Alaska Railroad, the Alaska Road Commission, the Reindeer Service, and the care of the Alaska insane were performed through the Division of Territories and Island Possessions. This Division likewise was charged with aiding the several other branches of the Interior Department operating in Alaska when determining matters of policy with reference to the Territory. The Director of the Division was chairman of the Inter-Departmental Committee on Alaska, a committee established by the President for the better coordination of all Federal activities in Alaska.

The year witnessed the regular biennial and an extraordinary session of the Alaska Legislature. Outstanding among the enactments furthering the utilization of the resources of the Territory and providing for the welfare of its citizens were an appropriation for the biennium of \$400,000 for roads and airfields, an act creating a Territorial Planning Council, one organizing an Aeronautics and Communications Commission, an enactment providing Social Security legislation, and another which established a new tax schedule for mines and mining.

The Alaska Railroad during the summer of 1936 provided three round-trip schedules per week between Seward and Fairbanks, with supplementary service out of Fairbanks to Nenana and Mount McKinley Park and out of Seward to Anchorage and Palmer. The Pacific coast maritime strike by disrupting steamer service to Alaska caused the operation of regular passenger trains to be discontinued from November 1, 1936, to February 18, 1937. The 1937 summer schedule was inaugurated June 8. When the Pacific coast maritime strike created a danger of a shortage of food and other necessary commodities in the Territory, The Alaska Railroad under Presidential authority operated an emergency steamship service from Seattle to Alaskan ports. River boat service was maintained on the Yukon during the season of navigation with bimonthly sailings between Nenana and Marshall. The deficit for the railroad for 1937 amounted to \$172,065, after including a loss of \$174,588 from the operation of ocean-going vessels during the maritime strike, and \$7,449 expended for the investigation of mineral and other resources. Excluding these two items, the railroad and river lines would show a profit on normal operations of \$9,971.

The Alaska Road Commission is charged with the construction and maintenance of roads, bridges, and trails in Alaska outside of national forests. Construction and maintenance of airfields, telephone lines, and shelter cabins is also undertaken for the Territory. The work accomplished during the fiscal year may be summarized as follows:

New construction: $63\frac{3}{4}$ miles of roads of which $16\frac{3}{4}$ miles were surfaced; 15 miles of sled road; $17\frac{1}{4}$ miles of trail, and a number of bridges.

Improvement: $75\frac{1}{2}$ miles of road reggraded and widened; 115 miles of road surfaced and 681 metal culverts installed.

Maintenance: $1,848\frac{3}{4}$ miles of road; $80\frac{1}{4}$ miles of tramway; $527\frac{1}{2}$ miles of sled road; 2,412 miles of permanent trail; and 304 miles of temporary flagged trail.

The cost during the year was \$1,055,432 of which \$392,632 was for new work and \$662,800 for maintenance and improvement.

Reindeer work has been administered under the supervision of the Reindeer Service with headquarters at Nome, Alaska. During the year 176,613 deer were handled and 67,094 newly marked. The number of reindeer recorded as being used by the Eskimos of Alaska for food, clothing and other purposes is 36,922, while the number of carcasses shipped from the Territory totaled 6,015. During the year 3,500 reindeer were driven from Barrow to Barter Island to protect the natives of that region against periodic food shortages.

Under provisions of law the insane of Alaska are cared for under contract with the Sanitarium Co., Portland, Oreg. The Interior Department is represented at the sanitarium by a medical supervisor with training and experience in psychiatry. At the beginning of the fiscal year, 309 patients were receiving treatment. During the year 49 patients were admitted and patients deceased, discharged or transferred number 62, leaving 296 persons receiving treatment at the end of the fiscal year. During the year improvements both in housing and treatment have been accomplished through additional buildings inauguration of insulin treatment, a recreational program, and occupational therapy.

TERRITORY OF HAWAII

The financial condition of the Territory is gratifyingly sound as is evidenced by the fact that at the beginning of the bienium, 1933-35, the general fund showed a deficiency of \$1,527,944.49, while the same fund records a surplus of \$1,315,133.51 at the close of the biennium on June 30, 1937. As to the biennium 1937-39, the Territory's budget is in balance.

Largely as a result of contributions from the Federal Government, extensive improvements were made to Territorial highways and airports, the sum of \$2,376,872 having been expended by the Department of Public Works during the fiscal year 1937. The largest single item was from the National Recovery Highway fund which aided materially in the construction or realignment of 19 miles of completed, improved

highways. Following the recommendations of the District Advisor, Airport Section, Bureau of Air Commerce, the legislature at its 1937 session appropriated the sum of \$200,000 for the improvement of airports to bring them up to Department of Commerce requirements and standards.

Hawaii's commerce, compiled on a calendar-year basis, showed a substantial increase in 1936; the total value of imports and exports amounting to \$219,639,784. This is an increase of more than \$35,000,000 over 1935. Imports from the mainland, United States and foreign countries during 1936 were valued at \$92,462,979 and exports \$127,176,805. Sugar, raw and refined, and canned pineapples and juice made up the bulk of the exports; the former being valued at \$67,975,548 and the latter \$51,452,493.

Among the accomplishments in the health administration of the Territory were the discovery of trichinosis and infectious jaundice, increased improvement in the control of venereal diseases (due to Social Security funds), work in connection with rehabilitation of crippled children (through Territorial and Social Security funds), and also establishment of additional clinics for mothers and infants in the Territory.

The estimated population shows an increase of 3,438 persons during the fiscal year, the total population on June 30, 1937, being estimated at 396,715, of whom 310,956 are American citizens.

HAWAIIAN HOMES COMMISSION

The Division maintained close relationship with the Hawaiian Homes Commission through Col. George Larrison, the Field Representative of the Department.

Major activities during the year included the reduction of homesteaders' debts to the commission and others; the increase in the percentage of homesteader labor in relation to the pineapple companies' labor in the Molokai homestead pineapple fields; the opening of additional homestead lots; the completion of a census of homesteaders with data regarding their blood mixtures, ancestry, occupations, etc.; an appraisal of the value of commission property; the adjudication in favor of the commission of the ownership of water diverted for the Molokai domestic water supply system; and the increase in acreages of food crops on Molokai.

PUERTO RICO

One of the important developments during the year was the purchase of the properties, rights, and franchises of the Ponce Electric Co. by the Government of Puerto Rico. Negotiations were completed on March 31, 1937, whereby funds amounting to \$1,400,000 were furnished by the Federal Emergency Public Works Administration, in

exchange for an equal par value of revenue bonds of the insular government, which are equally and ratably secured by the net revenues derived from the operation of the project, and are additionally payable from any revenues available from the sale of electric power from all other parts of the system owned by Utilization of the Water Resources. The acquisition of these properties at a total cost of \$1,082,431.41 will enable the insular government to carry forward on a well founded economic basis the development of its hydroelectric system. It will permit the insular government to distribute additional electric power in urban centers at a fair price to the consumers. The balance of funds over and above the purchase price will be used in purchasing additional equipment and improving the property which has been acquired.

Loans made by the former Puerto Rican Hurricane Relief Commission are now in process of composition and adjustment as authorized in Public Resolution No. 60, Seventy-fourth Congress, approved August 27, 1935. Regulations governing the procedure to be followed in making the compositions and adjustments were approved August 26, 1936, and, due to the present economic situation, were modified August 10, 1937. Two loans were paid off during the year. There are now 3,001 loans outstanding, which were originally contracted in the amount of \$5,655,760, 22 loans having been fully repaid. Prior to making adjustments, the total sum due the United States, including unpaid interest, exceeded \$6,000,000.

An issue of bonds for \$1,000,000,000, dated July 1, 1936, the proceeds from which were used in the construction of insular and municipal roads, were sold on behalf of the government of Puerto Rico. They were short-term bonds, \$500,000 being due July 1, 1937, and \$500,000 due July 1, 1938. Bidders were allowed to name a coupon rate which would permit them to submit offers of not less than par. The offer of the Chase National Bank of 100.08, which submitted the most favorable bid, the bonds to bear interest rate of $1\frac{1}{2}$ percent per annum, was accepted. Such a low rate of interest was most gratifying.

José Padin resigned as commissioner of education, effective December 31, 1936. The President nominated José M. Gallardo as his successor. Dr. Gallardo was confirmed by the Senate on May 3 and entered upon duty June 14, 1937. Funds were appropriated by the Legislature of Puerto Rico for the employment of 100 teachers of English from the continental United States during the year 1936 and for 100 additional teachers of English during 1937.

THE VIRGIN ISLANDS

Allocations of emergency relief funds by the Works Progress Administration provided for the improvement and extension of Bluebeard Castle Hotel, continuation of the homestead program, and

construction of roads connecting the most important agricultural districts with the three towns of the Islands.

Improvements to the Bluebeard Castle Hotel included construction of additional sleeping quarters, and a large water storage system. Essential grading and landscaping was begun with the aid of the C. C. C. organization.

There are now 380 holders of homesteads contracts in both the islands of St. Thomas and St. Croix. Extraordinary rainfall has resulted in unprecedented yields in the sugar crop in St. Croix, with the result that many homesteaders are reaping large returns from their plantings.

Many urgently needed improvements to the sewer and water systems were completed with Public Works funds. Government House, St. Croix, was reconstructed and fireproofed. The P. W. A. Housing Division has practically completed 3 urban housing projects consisting of 126 family units with a total of 230 rooms located in each of the 3 towns of the islands.

A joiners' cooperative and a farmers' cooperative distribution outlet have been successfully established after long planning. These cooperatives, together with the handicraft cooperative previously established, will furnish an outlet for an increasing amount of goods and promise to become important factors in the economic improvement of the islands.

A total of 777 ships with a tonnage of 3,104,153 gross tons called at the port of St. Thomas during the year, continuing the increase in shipping begun in 1933. Favorable consideration was given by the United States Army Engineers to the project for the improvement of St. Thomas Harbor. In this connection, a committee, appointed by the Governor, made an extensive study and report on the establishment of a graving dock in St. Thomas.

A well-known American corporation has established its principal place of business in St. Thomas. Developments of considerable importance to the economic future of the islands may be anticipated as a result of the action of this corporation. Considerable interest has been evinced recently on the part of American private capital in the possibilities of developing business opportunities in the Virgin Islands.

THE VIRGIN ISLANDS CO.

During the fiscal year, the company cultivated 2,200 acres of sugarcane, and prepared land to plant an additional 900 acres. The Company purchased more than \$50,000 worth of sugarcane from 700 homesteaders, which together with its own cane, produced 2,800 short tons of raw sugar, 2,500 tons being sold to refineries in the United States. During the year, the Company manufactured 93,000 gallons of pure cane juice rum which was placed in charred oak barrels to be

aged, increasing the total rum inventory to 496,000 gallons after deducting the 68,000 gallons sold during the year.

EQUATORIAL AND SOUTH SEA ISLANDS

Four cruises were made from Honolulu, Territory of Hawaii, to Jarvis, Baker, and Howland Islands during the year under the supervision of the field representative of the Department of the Interior, carrying water, food, and other supplies for the maintenance of the colonists stationed thereon. Buildings for housing personnel, aerological equipment, and miscellaneous supplies were constructed by the colonists on each island, and a landing field was prepared on Howland Island.

PUERTO RICO

RECONSTRUCTION ADMINISTRATION

Ernest Gruening, *Administrator*, Resigned July 13, 1937

IN the 6 years preceding 1935, Puerto Rico like other parts of the United States was suffering from the effects of the general economic depression. But even before the crash of 1929, sugar, the island's chief industry, had not been profitable for a decade, due to world overproduction. This had reduced employment and wages in the sugar industry—generally wiped out previous profits in many instances and increased indebtedness in many more.

Moreover, two hurricanes of unusual destructiveness swept over the island within the unprecedentedly brief period of 4 years, in 1928 and 1932, causing property losses estimated at \$175,000,000. These storms not only damaged every island industry but uprooted hundreds of thousands of families. The coffee agriculture of the island, on which half a million people depend, was almost destroyed, the fruit industry damaged to a degree so great that it has not recovered. Tobacco and sugar industries suffered greatly.

The sugar reduction program launched by the Jones-Costigan Act deprived some 25,000 wage earners of work.

National legislation to speed recovery on the continent, when extended to the island, in many instances added to the already existing hardships. Prices of food and other necessities which the island imports in large quantities from the mainland, were raised—quota production of sugar and tobacco was fixed below normal level. The extension of the N. R. A. and the attempt to fix wages in the needlework industry succeeded only in closing the shops of many entrepreneurs and causing further unemployment. Thus, the island's production generally was curtailed while living costs increased.

Aside, however, from these special, if temporary, adverse factors, it became apparent to those sincerely interested that Puerto Rico was suffering from certain fundamental social and economic ills, not entirely connected with world conditions but which if left unchecked would eventually bring social and economic chaos to the island.

Conditions in Puerto Rico were wretched when Spain retired in 1898. About 15 percent of the school population was in school. During the previous decade smallpox had taken an annual toll of 600 deaths. During the following 30 years under American administration economic and social conditions improved steadily. Modern sanitation, previously nonexistent, was introduced, an extensive road system was constructed, many public buildings, including primary and high schools, were erected. The university was founded. Yet tangible as were these accomplishments they were inadequate to meet the combined factors of depression, population growth, hurricanes, progressive land concentration, and soil erosion. Beginning with the island-wide hurricane of 1928 Puerto Rican economic conditions entered a crisis which became steadily aggravated. The hurricane of 1932 intensified the disaster. By the summer of 1934 unemployment reached a total of about 350,000.

One of the most fundamental problems has been the pressure of island population, increasing at the rate of 40,000 a year in an area already overcrowded and with no new frontiers for pioneering within the limits of its own shores. In the 39 years since the advent of American sovereignty the population has doubled. With the present population of approximately 1,800,000—529 persons to the square mile—with an arable area of approximately 1,225,000 acres or 0.7 acres per person, with which to sustain life, it was obvious that only a highly developed and well controlled program could come anywhere near meeting the problem in this strictly agricultural country. In spite of the insular government's extensive health program, general health conditions of the island, due to overcrowding, malnutrition, and a generally low standard of living, leave much to be desired and the death rates for tuberculosis, gastrointestinal diseases and malaria reach startling figures. Nearly 90 percent of the rural population in the island's interior and 40 percent of the urban inhabitants harbor the hookworm parasite.

Another basic problem has been a progressive concentration of the best lands of the island into fewer and fewer hands. The 1930 census showed that out of the 261,000 persons employed in agriculture 20 percent were farm operators. The number of farm operators declined from 5.2 percent of the total population in 1910 to 3.4 percent in 1930. In 1930 farms less than 20 acres in size, practically all of them owned by their operators, constituted 72 percent of the total number of farms; yet the acreage they comprised was only 12.4 percent of the total acreage in farms. Farms of less than 100 acres, 93.6 percent of the total, included merely 37 percent of the total land in farms in Puerto Rico. On the other hand, large farms of 500 acres and more, many of them of questioned validity under the Organic Act of Puerto Rico and only 367 in number (0.7 percent of total number of farms),

comprised 32 percent of all the area included in farms. The development of the sugar industry as a highly capitalized and technical business and the lack of a systematic agricultural policy to develop diversified farming, destructive storms causing loss of crops, bankruptcy and loss of the small agriculturists' holdings, ignorance about modern methods of cultivation which permitted increasing soil erosion, excessive population increase with mounting unemployment, and other factors, have increased the growing landlessness, crowding more people into city slum areas, thus aggravating overcrowding in the island's cities.

During the period 1933-35 Federal relief funds were first made available to Puerto Rico. It early became apparent, as stated above, that the economic plight of Puerto Rico was not really due to the same economic factors as on the mainland of the United States. Therefore Federal relief funds made available for the island could serve only a very temporary purpose, unless applied in such a manner as to effect certain fundamental revisions in the island's economy.

When the Puerto Rico Reconstruction Administration was established by Presidential order, dated May 28, 1935, under the authority of the Emergency Relief Appropriation Act of 1935, it was with the purpose of carrying out a comprehensive program which would not only relieve the immediate problems by creating widespread employment but would also tend toward a correction of adverse economic and social factors. For this purpose specific allotments were made for a wide variety of projects. A unique aspect of the program in Puerto Rico was that the tasks entrusted on the mainland to such varied agencies as the Works Progress Administration, the Public Works Administration, the Resettlement Administration, the Rural Electrification Administration, and the Tennessee Valley Authority were largely concentrated in the Puerto Rico Reconstruction Administration. Funds were allocated towards the end of August and in September 1935 the Puerto Rico Reconstruction Administration was organized in Puerto Rico. Adequate office space was not available. Temporary office buildings were, therefore, constructed and occupied by January 1936.

The duties assigned to the Puerto Rico Reconstruction Administration to make reconstruction possible and effective, called for rapid action, simultaneously on many fronts. The need of rapid expenditure to meet the existing major economic crisis conflicted with the desire for prudent, planned, economical disbursements, consonant with a long-range program. This dilemma existed until on February 11, 1936, Congress pass a bill establishing the moneys allocated to Puerto Rico as a special fund available to June 30, 1940, and the proceeds of operations into a revolving fund available indefinitely. This action by Congress enabled the Administration

while meeting the immediate emergency with work-relief projects, nevertheless to slow the tempo of its activities, to make a more analytical approach to many problems which experience indicated needed reconsideration, and to plan a sounder reconstruction program.

Activity had already begun along several lines, based generally upon a program which had formerly been developed by a policy committee composed of prominent Puerto Ricans, called to Washington in the early part of 1935 to formulate a program of reconstruction for the island. Land was purchased, a resettlement program to put worthy and small farmers back on the land started, workers' camps were organized as a part of the resettlement and forestry projects, giving opportunity for special educational work. Thousands of workers concentrated in comparatively large numbers called for a health program reaching all parts of the island, supplementing an already efficient but quantitatively insufficient insular program. Housing and public building began, with every effort being made to increase employment and to create projects of a lasting value.

By June 30, 1937, labor had been provided to the extent of 68,476,254 man-hours. The peak of employment, gradually rising, had been reached in November 1936, just prior to the beginning of the annual sugar harvest, when a total of 59,062 persons were employed, 97.5 percent from relief rolls. With outside employment increasing some of the Puerto Rico Reconstruction Administration construction projects ended. At the end of June 1937, there were 32,201 laborers (including workers under contracts) employed and 2,576 in the supervisory and administrative personnel.

On June 30, allocations to the P. R. R. A. from the emergency relief funds of 1935 and 1936 amounted to \$40,418,395. Of this amount there had been disbursed \$27,828,196.20. Other obligations or commitments amounted to \$5,542,653.58, leaving an unencumbered balance of \$7,047,545.22.

Principal disbursements were for wages and salaries, amounting to \$13,565,512.56; purchase of materials, supplies, and equipment, \$3,876,341.62; land purchased for rural electrification, forestation, cement plant, housing, and slum clearance, \$4,201,258.65; homesteading, resettlement, and the sugar program involved the expenditure of \$4,185,650.81, while payments on construction contracts were \$3,129,-665.56.

ORGANIZATION AND ADMINISTRATION

For administrative purposes the P. R. R. A. was organized with divisions of rural rehabilitation, rural electrification, forestry, university buildings, slum clearance, work relief, health, planning, census, legal, finance, business administration, and personnel. To many sections in these divisions was assigned the vast detail work of the

reconstruction program. The Administrator's office is in Washington, that of the Regional Administrator in San Juan.

The Reconstruction Administration has drawn on island engineers, architects, agronomists, physicians, nurses, social workers, laboratory technicians, lawyers, skilled clerical and office workers—practically every profession and specialized group—for its personnel.

Applications for administrative appointments have been filed by 45,040 persons, and employment for 4,934 to fill the executive, professional, and clerical positions has been provided for varying periods.

All P. R. R. A. purchases were and are made through the Procurement Division of the United States Treasury, while all disbursements are made by the United States Treasury Disbursement Office.

LAND UTILIZATION

Agriculture being Puerto Rico's main source of support, rural rehabilitation was made the cornerstone of the P. R. R. A. program. It seeks to reestablish on the land, as owners, hundreds of individuals, many of whom formerly were small farmers and others who were landless laborers. This marks the beginning of a new land policy.

The rural rehabilitation division of the P. R. R. A. is charged with the responsibility of carrying out the resettlement program. More than 70,000 acres of land have been purchased, or contracted for purchase, as a beginning of better land utilization. These lands are, or have been, under production in sugar, tobacco, coffee, and citrus fruit, the island's chief crops which provide the bulk of employment.

Laborers' camps have been established wherever large tracts of land have been acquired. With each camp program insofar as possible adapted to the particular needs of the community, its workers have been employed in agricultural and engineering work, incident to resettlement. Definite hours have been set aside for studies in practical agriculture, manual training, and elementary civics. Athletics have been stressed. Six land resettlement camps were operated, employing 4,237 men. This is in addition to 12 forestry camps, mentioned later.

For generations soil erosion has proceeded in Puerto Rico, unchecked. Already it has become a serious problem. The steep contours, the heavy precipitation, combined with faulty methods of cultivation, have permitted the washing out into the ocean of Puerto Rico's greatest natural asset, its soil—really its only true wealth. After any tropical shower the blue waters of the Caribbean are discolored brown for miles out to sea. Yet despite the obviousness of this problem it was never recognized in Puerto Rico until the P. R. R. A. was well under way. No consideration of soil erosion, no program to combat it, appeared in the original rehabilitation plan. Even contour plowing was not practiced in many parts of Puerto Rico. Instead the furrows run straight up and down the hills, veritable conduits for draining off

the topsoil. Terracing was unknown. In consequence, not only have many hills and upland valleys been largely denuded of their topsoil, but the infertile subsoil has washed down and covered over the topsoil of the valleys, seriously impairing the productivity.

A soil conservation camp, near Mayaguez, within a year, has successfully demonstrated that much eroding land can be saved for cultivation. Extensive work in terracing and soil-saving methods have demonstrated a practical program for Puerto Rico's eroded farm land. With proper treatment, hundreds of thousands of acres can be restored to profitable productivity. It is planned concomitantly to educate the farmers in these new methods and to extend this work during the coming year to other parts of the island, so that as rapidly as possible soil conservation and correct land utilization may replace the destructive methods hitherto in vogue in Puerto Rico.

First lands purchased for resettlers were some 4,000 acres, belonging to the American Suppliers, Inc., an absentee owner. The land was located in the mountainous interior, in the La Plata Valley, the finest tobacco section of Puerto Rico. Around 480 small farms have been created there, and allotted to laborers who qualified in the camps as candidates for a farm. On each a house is being or will be constructed. Up to June 30, 1937, 274 houses had been completed and 66 were under construction. Two hundred and seventy-one resettlers are already cultivating their farms, and as more houses are completed the rest will move in. These houses are built of concrete and are designed to be hurricane, earthquake, and termite proof.

Immediately after the resettlers occupied their farms a program of initial help was organized for them in the form of seed, fertilizers, insecticides. As a result, 1,070 acres have been prepared for planting up to June 30, 1937. Work on road building and other needed construction has been provided for the resettlers and the income from this labor totals \$9,982.75 in wages. Others are given part-time work in different projects of the P. R. R. A. on a salary basis. The rest of the time is taken up in working on their own farms. A total of 543 acres has been planted. Crops grown by the resettlers will be marketed through newly formed insular cooperative marketing associations, already operating.

During the period of land development, home construction, and erection of other buildings, a crop of tobacco and winter vegetables was planted, partly to utilize the land and in the case of the vegetables, to demonstrate the feasibility of raising unfamiliar crops. The tobacco was marketed through the Puerto Rico Tobacco Marketing Association. The vegetable crop was sold in local markets, camps, and New York markets, bringing in \$5,438.48. These receipts went into the revolving fund for further rehabilitation work.

To estimate the real importance of this vegetable raising program it is necessary to understand that this apparently simple and elementary form of agriculture has been virtually nonexistent in Puerto Rico. Despite complaints about the large quantities of foodstuffs that are imported at high prices, nothing practical had been done or had even been contemplated to remedy the situation. Previous to the program truck gardens had been almost nonexistent in Puerto Rico. Its landscape makes a sad contrast with the closely tilled fields of densely populated regions such as France, Germany, or Japan where every available square foot of ground is utilized and has been for generations. The failure so to utilize Puerto Rico's soil was the more paradoxical, first, in view of Puerto Rico's manifest land shortage and, second, its all year round productivity, which permits the growing of three crops of a food staple (such as corn) which in temperate zones can be produced only once annually.

Now vegetables never before seen have been introduced. They have been planted and raised by the men in the camps, then introduced into the camp fare, furnishing nutritive elements previously lacking. Three dozen different kinds of root and green vegetables, including turnips, cabbage, beans, okra, carrots, squash, beets, onions, potatoes, and radishes were grown in the camp truck gardens. The prevailing diet among the masses of Puerto Ricans, from whom the campers were drawn, has been consistently lacking in nutritive value. Polished rice, beans, and dried codfish, all imported, has been the standard fare. To these are now being added, through the program above outlined, a great variety of other foodstuffs. Many of the men, all of whom work in the gardens as a part of their training, are purposing to go into vegetable growing as soon as they become settled on their homesteads. Given an extension and amplification of this program, which will supplement the cane, coffee, tobacco, and other cash crops, the Puerto Rico of the future probably will become an intensely cultivated, terraced country supplying a very much larger proportion of food for home consumption, food more varied, more nutritive, and less costly.

In the tobacco, coffee, and citrus areas, where laborers were assigned as a part of the reconstruction program, more than 55,000 acres were planted to such food crops as plantains, bananas, cow peas, yams, corn beans, pigeon peas, sweetpotatoes, rice, cassava, and pumpkins. These plantings extended into more than two-thirds of the municipalities in the island. No attempt has been made to estimate the value of the food crops produced, but it is large, while the variety and extent is greater than the island has every known, though still far from adequate to meet island needs.

In the coffee section two large adjoining plantations, the Castaner and Llinas farms, of approximately 1,500 acres and about one-half

under coffee cultivation, have been purchased. They are being developed as a cooperative farming enterprise with provision for homes and 200 subsistence gardens for laborers, who will acquire them by purchase. The house construction program in this area is being continued and up to June 30, 1937, 57 houses had been completed and 25 were under way.

During the first week of June 1937, 52 houses were assigned to the qualified laborers of the Janer camp. Remunerative work is being provided so that the settlers may be self-sustaining while initiating the cultivation of their land. The project also is being used as a demonstration farm for the introduction of new crops in the coffee area. It is planned to plant around 50 acres of *Cran cultura* cane. Acres of vanilla have been planted. Citron and various tropical fruits have been introduced.

Another tract of 1,526 acres near Luquillo recently has been purchased. A workers' camp was opened on June 1 and 200 houses will be built for distribution. Four hundred and thirty-one acres have been purchased on the island of Vieques, and a camp of 180 men will be operated there. Fifty houses will be built.

In providing assistance to tobacco, coffee, and citrus farmers a uniform policy has been followed of supplying part-time labor, fertilizer, and other aid. In return farmers entered into contracts with the P. R. R. A. to sell at one-half assessed value small tracts of land for resettlement and homesteading, the amount sold in no instance exceeding 10 percent of the individual tract. Final agreements entered into on April 30, 1937, provided for the P. R. R. A. to acquire 9,229 acres from 1,607 tobacco farmers, 22,940 acres from 1,698 coffee farmers, and 1,010 acres from 124 citrus farmers. Houses are to be built on these plots and laborers can raise a large part of their subsistence. Rural resettlement has become an island-wide undertaking.

The Reconstruction Administration maintains a central service farm of 40 acres at La Plata which is rapidly converting itself into a practical school for the resettlers. All of its land is under cultivation following new methods in agriculture, judicious fertilizing, disease and insect control, and seed selection. The farm has provided large amounts of seeds, corn, beans, rice, sweetpotatoes, yucas, dasheens, and yams to the resettlers. The farm also supplies plants, baby chicks, livestock, use of barns, implements, and farm machinery. The superintendent of the service farm serves as the local representative of all marketing cooperatives and agricultural credit agencies.

A modern poultry farm has been established at the central service farm for the purpose of incubating and growing pure-bred poultry for distribution among the resettlers and homesteaders in the whole island

Also 40 pedigreed Anglo-Nubian goats have been sent to La Plata for breeding purposes in order to improve the goat breeds of the resettlers. These goats are high milk producers.

Five other smaller or junior service farms are in operation in this region, which includes five municipalities. They are affiliated with the central service farm. Service farms will be established at other land projects, as developed.

Perhaps not the least important of the land utilization program has been the follow-up service for resettlers. Much training is necessary among the country people of Puerto Rico to overcome the inertia engendered by forced unemployment, undernourishment, illness, and the rural rehabilitation division of the P. R. R. A. has provided an inspection force to assist the newly formed farmer or resettled laborer to plant a garden, raise poultry, or improve his home.

The program is aimed directly at checking land concentration, crowding of slums, and importation of foodstuffs. When completed, over 12,000 new houses will be built and as many families will for the first time be producing a good part of their food supply while living under standards heretofore unknown to them.

Not the least of the important projects carried out by the rural rehabilitation division has been the introduction of new crops designed to fill the gap that exists in an agricultural country largely devoted to specialized farming. This is especially important in the coffee area where the devastating hurricanes practically have ruined a once prosperous industry, and where curtailed markets have discouraged redevelopment of the original acres. Special attention has been given to the growth of vanilla, an enterprise which originally was investigated by the Puerto Rico Emergency Relief Administration. Studies continued by the Puerto Rico Reconstruction Administration indicated that 21,000 acres of coffee lands in successful vanilla production would supply the entire American market vanilla beans, supplanting present foreign imports valued at almost \$5,000,000 annually. The industry would provide labor for some 9,000 men and provide an entirely new secondary source of income for coffee farmers.

Vanilla propagation, requiring highly specialized technique, is being developed along with further experimentation in the field and laboratory. Methods of cultivation and curing which promise to evolve a profitable new industry are under careful scrutiny.

Other crops of promise are citron, sour lemon, and various insecticidal plants, the cultivation of which is being extended by the P. R. R. A.

CAMPS AND EDUCATION

In October and November 1935, steps were taken to establish the camps section of the P. R. R. A. Shortly thereafter it was organized together with the educational and supply units. It functions under the direction of the rural rehabilitation division.

The general aim of this section is not only to house workers on projects, but to contribute to human reconstruction by developing in the workers a greater ability to study and solve problems confronting them in their daily lives, through the inculcation of good social habits, agricultural and industrial skills, and through better nutrition coupled with the inculcation of certain elements of hygienic living.

In April 1936 the Reconstruction Administration took over two camps which were already in operation under the forestry division. These camps were enlarged and repaired. During June 1936 the construction of eight forestry camps was undertaken. Camps were constructed on land resettlement projects with the following result:

Eighteen camps have been operated at an average cost of \$1,200 a month each.

A total of 4,237 men have received the benefits of the workers' reconstruction camps.

A total of 1,055,360 man-hours have been worked.

A total of 5,376 man-months have been employed.

Salaries and wages have averaged \$963.54 per man-year of employment.

During the month of January 1937 camp Dona Juana was transferred to the C. C. C. from the Puerto Rico Reconstruction Administration.

At the end of March, camps Mariano Abril and Fernandez Juncos, and during the month of April, camps Elzaburu, Munoz Rivera, and Betances completed the periods for which they were intended and ceased to operate. Similar action was taken with 11 more camps at the end of June 1937.

The educational section of the Rural Rehabilitation Division began to operate January 2, 1936. Its staff is made up of a chief, a supervisor of health education and health recreation, a supervisor of agriculture, a head teacher in charge of special duties in the office, a secretary to the chief, and a stenographer. The present field personnel is as follows: 11 teachers of agriculture, 11 assistant camp teachers, and 11 recreational teachers.

The aforementioned objectives are being sought through health education, outdoor and indoor recreational activities, reading, discussions of social and economic problems directly affecting the laborers, gardening and poultry, and manual arts.

In September 1936 practical truck gardening was included in the educational program. This activity has given encouraging results. Tomatoes, beans, cabbages, carrots, onions, lettuce, cucumbers, egg-

plants, red peppers, potatoes, squash, and similar crops were harvested with splendid yields.

Over 75 percent of illiterate laborers in the camps have been taught to read and write sufficiently to continue their studies by themselves.

HEALTH ACTIVITIES

Success of the island reconstruction program to a large degree depends on the extent to which the people may have the facilities for both physical and economic health. Without the former the latter is wholly impossible. While the health activities of the P. R. R. A. confine themselves chiefly to those engaged in the organization, nevertheless a fair cross section of the entire island is reached. All workers are given medical examination, and treatment when needed.

In the camps future homesteaders are under constant observation. Every effort is made to have them physically fit before they assume their new obligations. Medical treatment is provided for the men's families as well as the men themselves. Hookworm elimination and prevention, inoculation against typhoid fever, vaccination for smallpox, prophylaxis and treatment of venereal disease, are part of the camp routine. Simple sanitation and personal hygiene have been taught in all camps.

Outside of the camps, dietary diseases and malaria have been given special study. More than 11 percent of the workers examined at Lafayette sugar central showed positive malaria reaction.

Rural medical centers have been in operation in sections where resettlement camps have not been established. These centers cover 51 municipalities. Each consists of three dispensaries staffed by a physician, nurse, social worker, and clerk. Through the dispensaries a careful rural health survey is under way. Both general and specialized clinics have been opened with a physician in attendance twice each week at each dispensary. Measures have been undertaken to check the spread of hookworm and malaria along with the treatment of those infected.

The health division has worked in close cooperation with the insular department of health, the department of education, and the School of Tropical Medicine.

Health Activities

Physical examinations.....	17, 402
Treatment for malaria.....	4, 070
Treatment for uncinariasis.....	13, 122
Typhoid fever inoculations.....	40, 720
Smallpox vaccinations.....	60, 245
Laboratory examinations.....	60, 245
Dental service.....	11, 930
Number of clinics held.....	6, 613
Patients attended.....	127, 569

SUGAR PROGRAM

Sugar is the backbone of Puerto Rico's economic life. Annually its agriculture, processing, and transportation represent a business turn-over of millions of dollars. Yet the industry has brought serious problems.

From a technical standpoint it is efficiently run. The criticism which it faces from a sector of Puerto Rican opinion relates to its social aspects. The four largest companies, while American, are absentees as far as Puerto Rico is concerned. Others are of Spanish ownership and therefore absentees from the national, American economy, as well as from the insular economy. The profits of these enterprises are taken away from the island and the political power of the companies frustrates adequate assessment and taxation. Moreover, the sugar industry—of necessity a large scale industry—has led to the progressive concentration of the best lands in fewer and fewer hands. The resulting large land holding is in contravention of the will of Congress, expressed 37 years ago and reaffirmed in the Organic Act limiting corporations engaged in agriculture to ownership of not more than 500 acres of land. (The validity of this legislation is for the first time being tested in the courts.) Below the larger agricultural-industrial sugar enterprises in the insular social structure are the colonos or cane farmers, independent cultivators whose holdings range from a fraction of an acre to over a thousand acres. These colonos deliver their cane to one of the company mills where it is ground and payment made on a basis of total quantity delivered plus sucrose content. The colonos have been emphatic in asserting a disadvantage in dealings with the larger corporate enterprises; that the virtual monopolies of these centrales resulted in unfavorable contracts to the growers; that credit conditions imposed upon them were oppressive. At the bottom of the sugar scale are the agricultural workers, poorly paid, inadequately housed, seasonably employed during the 5 months of the cane cutting season, and uprooted and unremunerated during the other seven. The great excess of population and labor supply makes betterment of their condition through unionization or collective bargaining difficult to attain.

The sugar program of the Puerto Rico Reconstruction Administration has been directed along the line of demonstrating through the yard-stock method that these problems might be corrected. For this purpose, the Central Lafayette with properties covering three municipalities in the southeastern part of the island, under French ownership for almost a century, was acquired in December 1936. It is noteworthy that this property was 100 percent absentee-owned both as regards the national and the insular economy. That was one impelling factor in its selection for purchase. The property

includes a modern raw sugar factory of 2,500 tons daily grinding capacity, 10,040 acres of land owned and approximately 8,000 additional acres under lease, leases also acquired. The property includes also railroads, rolling stock, work cattle, and other material and equipment essential for operation. To achieve the objectives of the sugar program, the following general set-up was adopted:

(a) Distribution of the land among laborer's cooperatives, and to resettled colonos.

(b) Operation of the mill on a cooperative basis, membership of which was to be the land cooperatives and colonos who had formerly ground their cane in this mill. This group numbered more than 300, the great majority of whom cultivated less than 10 acres each.

To carry out the above, a cooperative, the Asociasion Azucarera Cooperativa Lafayette, was organized by a group of the farmer-colonos on November 19, 1936, and a month later, simultaneously with the purchase of the sugar properties, this cooperative assumed title, and obligated itself to pay to the Puerto Rico Reconstruction Administration the full purchase price of the mill properties. One million three hundred and sixty-three thousand one hundred and ninety-nine dollars and forty cents was the amount paid for the mill property which will be amortized over a period of 20 years with payment of principal to begin in 1940 and with interest at 3 percent. The Puerto Rico Reconstruction Administration holds a first mortgage on all property as security for this loan. An additional advance of \$261,841.12, secured by a lien on the industrial benefits of operations, was extended to the cooperative for initial operating expenses.

On December 11, 1936, eight land cooperatives were organized from among the agricultural workmen. A total of 3,006.91 cuerdas of land has been transferred to these eight land cooperatives, together with the cane growing at the time of the transaction, representing a total value of \$1,543,741.51. These land cooperatives also purchased and hold in joint ownership the livestock, agricultural implements, and other movable property necessary for the field operations. The Puerto Rico Reconstruction Administration holds as security for these loans a first mortgage on all this property, and in addition the mill cooperative and the several land cooperatives have entered into a management agreement with the administrator of the Puerto Rico Reconstruction Administration whereby their interests will be handled by the manager of the mill cooperative, who is a P. R. R. A. employee, thus securing a central and efficient management. The balance of the land is being held by the administration for organizing additional land cooperatives so that every worker's family in the Lafayette area may be given the opportunity to participate in the enterprise and to become a small home owner. Meanwhile this land, destined for future cooperatives,

is being cultivated for the account of the administration by the centralized management.

As an integral part of membership in the land cooperatives, a resettlement program, designed to give better living conditions to the labor members, has been inaugurated by the P. R. R. A. and land has been set aside for the building of approximately 1,000 laborers' homes. The first 300 houses are under construction. Each family will be given sufficient land for gardening and for raising small livestock and poultry. Payment will be amortized over a period of years. A central service farm has been established to assist the resettled laborers, as well as the colonos who are members of the mill cooperative, with their agricultural problems. The first buildings have been erected. Three vocational schools, to be operated by the insular government, have been erected within the district and a new modern hospital is being built at the Central for the benefit of the laborers, the other employees, and their families. At the end of the first year's operations, June 30, 1937, the cooperative ground 257,110.27 tons of cane and manufactured 258,308 bags, 250 pounds each, of raw sugar. The average yield was 12.69 percent. Of this amount, 76,383.27 tons of cane were delivered from the land of the agricultural cooperatives, the balance from the lands held by the Reconstruction Administration and by independent colonos on their own property. Despite the fact that management of the properties was not acquired until January 1, 1937, and consequently no control was had over initial operating expenses, the project will show a profit of over \$200,000 on the first year's business.

The acquisition of Lafayette, which was a totally absentee-owned property sending its profits abroad to a single family, is an important move seeking to rectify the most criticized social aspects of the sugar industry in Puerto Rico. Assuming management to be successful, it should result in—

1. Keeping the profits of the enterprise in Puerto Rico.
2. Elimination of exploitation.
3. Improved housing, sanitation, and social service, tending to establish higher standards of social responsibility among sugar enterprises generally.

In the rehabilitation program as first proposed in Puerto Rico, as presented to the Reconstruction Administration and widely publicized, the purchase of a number of mills simultaneously was recommended, as well as their transfer to the hands of colonos. The Reconstruction Administration after careful consideration modified both proposals. It limited itself, for the present, to the acquisition of one mill in behalf of cooperatives, in the belief that prudence dictates a careful exploration of the possibilities of operation of one such enterprise before any wholesale embarkation on a program obviously so administratively

difficult and fraught with important consequences. Second, it rejected the idea of loaning substantial sums of public money solely for the rehabilitation of a relatively limited group of farmers, some of them substantially well-to-do, to the exclusion of a great body of landless and indigent agricultural workers whose distressed condition under this plan would have remained virtually unmodified. The fundamental objectives—the correction of social weaknesses inherent in the rapid development of Puerto Rico's indispensable part-sugar economy—are, however, maintained unqualifiedly.

COCONUT BUD ROT ERADICATION PROJECT

According to a report by the insular experiment station after the 1932 hurricane, 185,005 palm trees were destroyed by the two successive hurricanes of 1928 and 1932. It also reported 603,193 standing palms. The palms, palm leaves, stumps, and other coconut trash were lying between the rows of standing palms hindering cultivation of the groves and serving as excellent harboring places for destructive insects, especially the well-known destructive Rhinoceros beetle, transmitter of the dreaded coconut bud rot disease. Production of nuts sank to the lowest level on record, and many groves were in a state of virtual abandonment.

With an allocation of \$111,900 a strict sanitation campaign was prosecuted—an essential forerunner of any cultivation or replanting. Its objectives were to destroy by fire all tree trunks on the ground, rotten stumps, standing diseased palms, leaves and trash, to prevent the spread of disease from these foci of infestation to healthy growing palms, and to clear the ground for cultivation and further planting. It was calculated that 335,000 palm trees were required to replace those uprooted by storms and to plant barren areas in existing groves.

The program was launched in May 1936 as a relief project under the rural rehabilitation division of the P. R. R. A. A monthly average of 300 laborers were given work for 5 days a week, at a daily wage of 75 cents, for a period of 1 year and 1 month. On June 30, 1937, a total of 25,690.48 acres had been cleaned; 57,976 standing rotten palms and fallen trunks and 232,909 stumps had been removed, 586,808 larvae and 40,729 adult beetles had been destroyed. These activities were confined to the Bayamon, Canovanas, Mayaguez, and Arroyo districts and are 93.5 percent complete.

COOPERATIVES

Agricultural cooperatives are not new in Puerto Rico, but due to lack of trained leadership, under capitalization and competition from the speculative groups, the cooperative movement has, until recently, suffered many setbacks.

In the last 3 years both the insular and the Federal Government have taken important steps to aid the development of cooperatives. The insular legislature created a fund of \$100,000 to further cooperatives in the island, and through this the "Cafeteros de Puerto Rico" was able to expand its functions until it now occupies a dominating place in the coffee industry.

The extension to Puerto Rico of the Bank for Cooperatives and of the Production Credit Association, aided in forming the Puerto Rico Tobacco Marketing Association.

The P. R. R. A. has assisted in improving and consolidating cooperatives already in existence, and attempts to fill in the gaps with new cooperatives where these were needed.

With the aid of the insular government in 1935, 163 cotton farmers, organized for cooperative marketing under the Puerto Rico Marketing Association for Minor Crops, produced 211 bales of cotton which sold in New York for \$30,000. Last year 743 farmers produced and sold 544 bales of cotton for \$88,000. The price in 1936 to the farmer was better, and the cost of ginning and marketing was reduced by half.

To furnish further aid, the P. R. R. A. has erected a cotton gin and warehouse at Isabela of adequate capacity, it is believed, to meet the expanding needs of a group of farmers who, by their efforts, are doing much for their own rehabilitation. A corn cooperative also has been organized, based on the experience with the cotton growers. A corn bin and mill have been erected along side the cotton gin at Isabela.

In another field again working with the insular government, a needlework cooperative has been established, designed to aid many thousands of skilled needleworkers, whose employment ceased with the ending of relief, in becoming self-supporting. Organized as Puerto Rico Handcraft, Inc., this organization has been selling its high grade handmade, silk garments in the island for some months, preparatory to seeking an outlet in the United States.

Needlework has developed into one of the island's leading industries offering employment to some 50,000 women, many of them on part time and working in their homes. Although wages have been low the industry has provided the sole means of support for thousands of families. As now organized, the industry almost invariably calls for a degree of hand and machine work in Puerto Rico on materials cut and stamped on the mainland. The work is done usually on a contract basis through agents and subagents whose commissions, together with competition from oriental countries for similar work, keep wages at a minimum. The needlecraft cooperative will do its own designing, cutting, finishing, and marketing.

On June 1, 1937, the planning division of the P. R. R. A., having functioned effectively in the two initial years of planning, was discontinued and was reorganized as the division of cooperatives in order

to concentrate its attention during the coming fiscal year on the organization of the following cooperative enterprises: Agricultural cooperative of Puerto Rico (a purchasing cooperative), Arecibo Fruit Growers' Cooperative Association (a canning cooperative), a cooperative association of all insular vegetable growers, and a cooperative project for the manufacture of yuca starch, vegetable oil and lard, and cattle feed. The first two mentioned have already been organized and construction has been started on the canning building for the Arecibo Fruit Growers' Cooperative Association.

CATTLE TICK ERADICATION

A tropical variety of fever tick, about which little information is available, has long infested not only island cattle but horses, mules, and goats. The annual economic loss resulting from tick infection has been large and this parasite, in cattle, has been one of the chief factors in holding back the proper development of an island dairy and meat industry. Local consumption of milk if averaged on a per capita basis, would amount to about a spoonful daily. In the diet of the masses beef is practically unknown.

In cooperation with the insular department of agriculture and commerce, the P. R. R. A. initiated a program designed to clean the island of the fever tick. The insular legislature cooperated by enacting a stringent quarantine law and work was commenced in April 1936.

Research work is being conducted by an entomologist. This work, so far as is known, is the first official research relative to the variety of tick found in Puerto Rico and it is likely to be some months before its life cycle and habits have been ascertained.

To carry out the program for fever tick eradication the island has been divided into three zones. In the western zone, 290 dipping vats have been completed, approximately 5 kilometers apart. Late in March a systematic dipping campaign was begun and the area was placed under quarantine. By the end of June 502,296 cattle, 12,492 goats, and 76,261 horses and mules had been twice presented at the tanks for dipping at 14-day intervals. Work is supervised and directed by the local representative of the Bureau of Animal Industry of the Department of Agriculture.

RURAL ELECTRIFICATION

The topography, meteorology, and agronomy of Puerto Rico combine to make the island an ideal terrain for the development of hydro-electricity. Puerto Rico's steep hills, rising to the 4,400-foot apex of the twin peaks of Los Picachos, at almost the exact center of the island, release a heavy precipitation. In the Luquillo Range at the

eastern end of the island it reaches 150 inches annually. The resulting cascades in the steep and narrow gorges furnish potential sites for dams and reservoirs, and the generation of power from the interaction of gravity and water. When it has completed its precipitous descent the stream is utilized for irrigating the cane fields which fill the coastal lowlands. With no mineral fuel resources, with every gallon of oil or pound of coal transported from the continent, at high prices, the conservation of the natural water supply, and its conversion into motive power, is in every sense an economically and socially desirable objective. Thereby a locally available, self-replenishing and perpetual source of energy, obtainable ultimately at moderate prices, replaces an exhaustible, expensive, imported fuel. And thus the two essential objectives, power production and irrigation, are attained, effectively distributing and diminishing costs.

Over 20 years ago the insular government entered the field of power development incidental to the establishment of a public irrigation system. In 1915 a division of the insular department of the interior was created, known as utilization of water resources, having under its active control the Puerto Rico Irrigation Service and, later, the Isabela Irrigation Service. Lack of funds prevented more extended development. The P. R. R. A. program for rural electrification has not only provided the insular government with long-needed assistance to carry on the extension of its system and the development of one of the island's most valuable natural resources, but has proved an excellent work-relief project. An area of approximately one-half of the island in which a third of the population resides is included in the territory served, and to be served, by the P. R. R. A. program. Not only is the additional power needed to meet existing demands but to provide for expanding industrial requirements not met by private enterprise.

The rural electrification program of the P. R. R. A. includes development of two new water power projects, long under study by the insular government, and the addition of new units to hydroelectric plants already in operation. Two hundred miles of transmission lines and 200 miles of distribution lines are included. As completed all of the units are being coordinated into a single service which in turn is interconnected with privately owned public-utility lines for island-wide exchange of power when needed. When the P. R. R. A. initiated its power program three large private corporations controlled the three major urban districts of San Juan, Ponce, and Mayaguez. Believing the inclusion of one or more of these concentrated markets desirable for the insular system, the P. R. R. A. requested the assistance of the Federal Power Commission and the Rural Electrification Administration, which through their respective executives sent experts who approved the purchase of the Ponce and Mayaguez utilities.

By means of a P. W. A. loan the Ponce plant was acquired in April 1937 and incorporated in the utilization of water resources. Simultaneously, substantial reduction in rates for the electric customers of Ponce took place. Immediately thereafter, following the prescribed program, negotiations were entered into for the similar acquisition of the Mayaguez Power & Light Co., a move highly desired by the citizenry of that community. This transaction which would result in a unified power system occupying the southwestern half of the island, had not been consummated on June 30.

The rural electrification division began to function in October 1935. Of the projects for which funds were allotted there have been completed and transferred to the government of Puerto Rico, Toro Negro Hydroelectric Plant No. 1, started October 10, 1935, completed March 20, 1937, at a cost of \$692,600, Toro Negro Hydroelectric Plant No. 2 started October 10, 1935, completed March 20, 1937, at a cost of \$493,100, and Carite Hydroelectric Plant No. 3 started October 7, 1935, completed January 8, 1937, at a cost of \$227,000. The combined annual output of these plants is 26,000,000 kilowatt-hours.

The cost of transmission and distributing lines and telephone equipment constructed and installed under these projects, is included in the figures quoted. Ninety-four miles of 37-kilovolt transmission lines and 192 miles of distributing lines to which 2,880 customers have been connected have been constructed to date.

It is estimated that the Dos Bocas Dam started November 1, 1937, and the Garzas Dam started October 7, 1935, to be completed in 1939, will cost approximately \$3,834,000 and \$3,875,000, respectively. The combined annual output will be in the neighborhood of 64,000,000 kilowatt-hours.

The expenditures on the Dos Bocas project to date have been principally for surveys and engineering, construction materials and equipment, and the usual construction camp facilities. In addition to similar items of expense, 13.2 miles of all-weather access roads have been completed on the Garzas project, and 1,800 lineal feet of tunnel driven.

The engineering, supervision, and construction of these rural electrification projects have provided work for 291 appointive employees to whom \$447,593.24 has been paid in salaries, and 4,221,463 man-hours in labor at a cost of \$1,007,036 in wages.

REFORESTATION

The valuable virgin forest which covered most of Puerto Rico when Columbus discovered it, has long since disappeared except in small areas, principally in the Luquillo Range of the Caribbean National Forest and the Maricao Insular Forest.

Of the total insular extent of approximately 2,000,000 acres, it is estimated that 500,000 acres are best suited for growing timber. Approximately 300,000 acres of this potential forest area are so owned and located as to be practicable for purchase and administration by the government as public forest. So utilized, these forests, besides being of great commercial value, would be of great benefit in conserving stream flow—essential for the insular hydroelectric and irrigation systems—and in checking soil erosion. The remaining 200,000 acres are chiefly in small parcels and so scattered that the necessary reforestation can best be accomplished by private owners.

Such a reforestation program has been initiated by the forestry division of the Puerto Rico Reconstruction Administration, in cooperation with the United States Forest Service and the insular forest service. It should result in the public reforestation of a total area of slightly more than 200,000 acres by 1940, or about 40 percent of the island's total area suitable for forestation.

Climatic conditions are excellent for tree growth in Puerto Rico due to the year-round growing season and generally abundant rainfall. Many varieties of valuable cabinet woods thrive. Some of the Spanish cedar seedlings planted in 1935 attained a growth of 22 feet within a year, almost 2 feet per month.

The forestry division of the P. R. R. A., organized in September 1935, began actual field work the following month. Since then—up to June 30, 1937—approximately 20,000 acres of denuded forest lands have been purchased and planted. The cost of the land was \$300,000, or \$15 an acre, including cost of examinations, appraisals, and surveys.

Three forest nurseries with a capacity of 20,000,000 trees per year have been established and have produced the equivalent of 30,000,000 trees at an average cost of \$6.33 per thousand. Fifteen thousand acres of land have been cleared and planted at an average cost of \$33.33 per acre. Approximately 50 miles of road has been constructed at an average cost of \$10,000 per mile. More than 100,000 pounds of seed have been gathered from the more desirable types of trees which the island supplies while 18,000 pounds of seed have been brought from South and Central American countries, including Haiti, Panama, Trinidad, Guadalupe, and the Dominican Republic. In general three types of trees have been planted, those useful for construction, tropical hardwoods suitable for cabinet use, and quick-growing trees for making charcoal. Charcoal is still the fuel in most common domestic use in Puerto Rico and many tons are imported annually.

The program has had a marked influence in stimulating general interest in reforestation in the island. The insular forest service has reported the distribution of more than 2,000,000 seedlings. These were distributed on request to individuals for planting wind-

rows or woodlots rather than for foresting definite areas. Nevertheless, these seedlings were sufficient to plant over 1,500 acres.

As a part of the forestry program a recreation park was developed in Luquillo forest, visited by more than 50,000 people within the year. The recreational area is provided with roads, trails, shelters, overnight cabins, and two swimming pools. Completion of the roads now under construction will bring the recreational area within easy access of the eastern half of the island.

Mona Island—lying in the Mona passage separating Puerto Rico and the Dominican Republic—some 25 square miles in extent, formerly rich in tropical timber, and virtually a deserted island, with two cave-dwelling families and three lighthouse keepers as its sole human inhabitants, is now being reforested. It has a large game supply and offers alluring possibilities as a unique tropical forest, game preserve, and recreational area.

UNIVERSITY BUILDINGS

The University of Puerto Rico, to which the island looks for trained personnel for development of its agricultural resources, protection of health, and broad community leadership, is largely supported by a special property tax, provided more than 10 years ago. Because of financial distress in much of the farming area the university's income had been greatly reduced during a period in which there has been an exceptional increase in enrollment and enlarged demands on the institution. An enrollment of 1,400 in 1929 has increased to more than 5,000. As a result the university has fallen behind in an orderly program of supplying the barest needs in plant and equipment.

Despite many handicaps, the university, founded in 1903, has grown steadily, has established an enviable reputation in the field of tropical medicine, and made useful contributions to insular agriculture and engineering.

The building program, made possible by a P. R. R. A. grant of \$1,422,000, provided for new structures for the colleges of liberal arts and sciences, law, and pharmacy situated at Rio Piedras, and the College of Agriculture and Mechanic Arts at Mayaguez. A university building division was organized, work was started on the first building on December 5, 1935, and as of June 30, 1937, 2,267,176 man-hours of work had been provided. This building program is largely completed and the new structures will be occupied during the coming academic year.

The library, normal building, the home economics building, the biology building, and teachers' college, all located at Rio Piedras, have been completed and transferred to the board of trustees for the

use of the university. At Mayaguez, the plant industry building and the agricultural annexes also have been completed.

Reconstruction of the administration building at Rio Piedras has been partially completed. An additional appropriation of \$65,000 is needed to complete the interior of this edifice.

Approximately \$60,000 have been spent on campus improvements including fence, sidewalks, athletic field, and roads. The contract for installation of water supply and an electric plant for the college at Mayaguez remains unexecuted, strikes in the United States having delayed the delivery of materials.

Work has been started on enlargement and reconstruction of the School of Tropical Medicine, using \$240,000 not included in the original allotment made to the university. The enlarged facilities which the building and its adjoining hospital will give the School of Tropical Medicine are of vast importance, not merely for improving the island health program, but for making Puerto Rico, strategically located in the tropics and on the inter-American air routes, the most important center for tropical medicine research in the Western Hemisphere.

CEMENT PLANT

Edwin C. Eckel, chief geologist of the T. V. A., in 1934 and again in 1936, studied the feasibility of the establishment of a cement plant in Puerto Rico, to be government-owned and operated and to supply all government requirements. He concluded that a plant of 1,000 barrels daily capacity was justified and approved the feasibility of the project as a government property. His estimate of production costs indicated a large saving to the government in view of the extensive housing project planned as a fundamental part of the reconstruction program. Cheaper cement will make possible a greater number of houses.

Construction of the cement plant has been commenced near Catano, across the bay from San Juan, with \$1,225,000 appropriated for the project. Since the insular government normally is the largest consumer of cement, an arrangement has been made whereby the plant is to be operated by the insular government and an appropriation of \$150,000 for this purpose was provided by the last session of the insular legislature. The plant will be ready for operation about January 1, 1938.

It is expected that under government operation the plant will be able to produce cement at a price approximately equal to that at which foreign cements are delivered in Puerto Rico. However, as only cement of American manufacture is used in government projects it is confidently believed that government operation of the cement plant will result in a saving on all public construction.

WORK RELIEF

With the ending of the administration of the Federal Emergency Relief Administration in Puerto Rico in June 1936, and the cessation of all direct relief, not only were thousands of Puerto Ricans deprived of needed financial and material assistance, but numerous projects were left incomplete, adding to unemployment in many municipalities. The work-relief division was conceived to finish a wide variety of non-Federal public projects already undertaken, to provide employment particularly in those sections not otherwise benefited by P. R. R. A. activities. In all 177 projects have been undertaken, many of them finished, with total appropriations of approximately \$1,400,000, of which more than \$1,000,000 has been paid in wages. More than 5,000,000 man-hours of work have been provided.

Work-relief projects include the completion of more than 82 kilometers of roads, 13.7 kilometers of streets, 10.7 kilometers of curbing and guttering, and 3 kilometers of side walks. Twenty-four public-school buildings have been reconstructed or repaired, ranging in size from one-room rural schools to urban high schools; a new vocational building for the School of the Blind was erected, and a two-story building at the leper colony, partially destroyed by fire, was reconstructed. Two municipal hospitals were built and restored and two city halls reconstructed. A cotton gin and warehouse, at Isabela, was completed for a cotton cooperative organized under the auspices of the P. R. R. A. A cooperative corn mill and warehouse was completed and machinery installed. Several laboratories were reconditioned. Extensive repairs were made to the patio of the Governor's palace, built by the Spanish more than 400 years ago—a building of great historical value and architectural interest.

A concrete landing pier was built at Sein Bay, Culebra, where naval vessels and marines assemble for winter maneuvers. On the island of Vieques, where unemployment has been high, the municipal power plant was modernized in cooperation with the municipality. At Mayaguez more than a mile of concrete storm sewer was constructed, and repairs, reconstruction, and additions made to various municipal water systems and filter plants, including the laying of several miles of piping. At Aguadilla an athletic field and recreation park were built to mark the site where Columbus landed in 1493, the only spot under the American flag where the discoverer set foot. Several other public playgrounds and recreational centers were constructed or improved, in several instances with the communities contributing to the cost.

Forty-five medical dispensaries were completed and provision made for the erection of 19 buildings to house health units to be operated by the insular government in connection with the reconstruction program.

Reconstruction totaling \$355,000 on War Department property in San Juan was likewise undertaken. It includes the reconstruction of the ancient Santo Domingo barracks, one of the island's historic edifices dating from the early sixteenth century. It also includes the remodeling of the old "Manicomio", another colonial edifice, to render it available for the motorized transport of the Sixty-Fifth United States Infantry. The War Department in turn has transferred to the insular government an extremely valuable tract of land of some 7 acres on Ponce de Leon Avenue, the capital's principal thoroughfare. This tract, located between the School of Tropical Medicine and the United States Weather Bureau, is to be reserved for public medical purposes, the western half of the lot specifically for future expansion of work in tropical medicine.

HURRICANE STATIC RESEARCH

Research was originated under the Federal Emergency Relief Administration and continued by the Puerto Rico Reconstruction Administration to seek to improve methods of hurricane prediction based on the detection of static electricity in the atmosphere. This work is proceeding in a special laboratory erected on the grounds of the University of Puerto Rico, in conjunction with a similar laboratory at the University of Florida. Since last January two stations operated by the United States Naval Research Laboratory and two operated by the National Research Council of Canada have been collaborating.

HOUSING AND SLUM CLEARANCE

The great deficiencies in the housing of Puerto Rico's teeming population are apparent to even the most casual visitor.

The urban housing program of the P. R. R. A. not only aims to provide more satisfactory shelters for hundreds of thousands of slum dwellers, but also to distribute the population more rationally, and thus take the first steps toward breaking up the congested slum areas of San Juan and other island cities.

Surveys have been made in each slum area, listing all families, their income, rent now paid, expenses, etc., so as to determine the financial status of the groups to be affected and to adjust the program accordingly.

The main slum clearance projects are well advanced. One is San Juan, on reclaimed land transferred by the insular government, will provide 216 family units, and a similar project in Ponce, 142 family units. Now nearing completion and ready for occupancy on or before September 1, the San Juan project is a series of adjoining apartments of reinforced concrete, built to withstand hurricanes,

earthquake, and fire. The structures are three stories high, with interior patio, and four apartments to a floor. Each apartment has two bed rooms, bath, kitchen, and a large combined living and dining room. A recreational building provides playground space for children.

On a tract of 220 acres of land at Hato Rey, a suburb of San Juan, work has commenced for the erection of 416 houses—the beginning of a large model village. The site has 2,619 residential lots, with ample space reserved for parks, schools, and churches. Streets have already been laid out, sewerage and water system provided, and the first group of houses will be completed within a few months.

The Juan Morell Campos development at Ponce, is a modern urbanization on a 41-acre tract on which there will be 142 home units of four rooms each.

Cost of these houses will average \$2,000 not including the added cost of development, construction of streets, and utilities. It is planned to rent them to families now living in the slum areas at rents of from \$8 to \$16 per month, with eventual ownership, under terms not finally determined.

Another project of far-reaching possibilities is the Trujillo Alto development. A farm of 485 acres has been purchased for resettlement purposes but it has been decided (because of its closeness to San Juan) to place on the 1-acre homesteads, heads of families now employed in the city. Concrete houses, costing not more than \$900 are now being constructed and a rural village of over 350 houses will result. This will be the first of similar projects as a practical approach toward slum clearance.

THE ALASKA RAILROAD

O. F. Ohlson, *General Manager*

THE passenger-train schedule in effect during the summer of 1936 provided for three round trips each week between Seward and Fairbanks, with supplementary service out of Seward to Anchorage and Palmer, and out of Fairbanks to Nenana and McKinley Park, operating in conjunction with the arrival of passenger steamers at Seward on Tuesdays and Fridays of each week, and with the bimonthly arrival of river steamers at Nenana from Dawson on the upper Yukon River, and from Marshall on the lower Yukon River.

A reduction was made on September 26 to one round trip each week. From November 1, 1936, to February 17, 1937, passenger-train service was not rendered except to furnish connections with the arrival at Seward of the two voyages of the steamship *General W. C. Gorgas*. With the resumption of regular steamer service between Seattle and Seward, regular weekly passenger-train service was reinstated on February 18. During April and for 2 weeks in May, passenger service was operated biweekly to correspond with arrival of passenger steamers at Seward. The 1937 summer schedule, identical to that operated in 1936, was adopted on June 8.

Mixed train service between Anchorage and Matanuska branch line points was operated daily until August 23, 1936, when the Sunday train was discontinued. From the 1st of November to the end of the fiscal year, mixed train service to Matanuska branch line points was operated variously with one to three round trips being made, depending upon the volume of traffic to be moved.

Freight-train service between Seward and Fairbanks varied from weekly to biweekly, depending upon the volume of traffic, and the arrival of steamer connections. During the period November 1, 1936, to February 17, 1937, when regular passenger-train service was suspended, freight trains were operated as mixed trains, operating on a weekly schedule, connecting at Seward with Coast Guard cutters which handled United States mail between Seward and Juneau.

Special passenger trains and extra freight trains were operated when the volume of traffic offered for movement could not be handled by regular service.

During the period July 1, 1936, to close of river navigation on October 13, 1936, a round trip by river steamer was made every 2 weeks between Nenana and Marshall.

River boat service for the 1937 season of river navigation will consist of one round trip every 2 weeks between Nenana and Marshall.

During the fiscal year, a total of nine round trips was made by river boats between Nenana and Marshall, one round trip between Nenana and Ruby, four round trips between Nenana and Tanana, one round trip each between Nenana and Hot Springs and Nenana and Squaw Point; one one-way trip was also made from Tanana to Nenana.

A 200-ton capacity barge was constructed at Nenana and placed in service in May 1937.

Freight handled by river steamers during the fiscal year amounted to approximately 6,220 tons, this being an increase of 2,172 tons over the amount handled the preceding year and consisting mostly of mining machinery and fuel oil, and being indicative of a revival of gold mining along the Yukon River. Passengers handled amounted to 325, a decrease of 19 under the number handled in 1936.

During the year, 10 freight tariffs, five supplements to freight tariffs, 11 passenger tariffs and 1 supplement to passenger tariffs were issued, regulating rates on freight and passenger traffic.

A study of the freight rate structure was undertaken during the latter part of the year, the result of which was a general increase in rates, made applicable to practically all classes and commodities.

Coal rates were increased on May 20, 1937, in amounts varying from 25 to 30 cents per ton on local shipments; and the low export rates were increased 60 cents per ton. Petroleum and petroleum products were increased on the same date 15 cents per hundred pounds, being equivalent to 1 cent per gallon. The through rates applying from Seattle and Tacoma, Wash., to railroad points were revised on May 30, 1937, to provide for a 3-percent increase on the railroad proportion of the through rates and a Seward terminal charge of \$2 per ton. Local class and commodity rates were increased 3 percent and tariff issued in June, to become effective during July 1937.

A competitive tariff was issued on April 12, 1937, naming carload rates on beer, groceries, and items of iron and steel from Seattle to Anchorage, at an increase over similar rates in effect last year during the period of navigation on Cook Inlet.

The Alaska Steamship Co., a party to the through tariff, increased their proportion of the through rate 5 cents per hundred pounds on October 15, 1936.

The number of rail-line revenue passengers carried in 1937 totaled 27,675 passengers, a decrease of 15,406 passengers as compared with last year, and due largely to a reduction in the local travel between Anchorage and Matanuska Valley points, also to reduced travel during the period of the maritime strike. Rail-line revenue passenger miles for the same period decreased 919,030 passenger-miles, the total for 1937 being 3,672,826 miles.

Passenger earnings, rail-line, decreased \$34,702.19 in 1937, as compared to earnings in 1936, the passenger revenue for 1937 being \$196,449.72. The average revenue per passenger increased from \$5.36 in 1936 to \$7.09 in 1937, caused by a greater number of long-haul passengers being handled.

Rail-line freight hauled totaled 157,717 tons, an increase of 6,707 tons over that handled in 1936. The tonnage of rail-line freight included 94,294 tons of coal, 2,089 more tons of coal than was hauled in 1936. The rail line ton-miles revenue freight was 25,676,316 ton-miles, an increase of 2,075,425 ton-miles over 1936.

Rail-line freight revenue totaled \$1,449,010.51, an increase of \$110,689.82 over the previous year.

The pay roll for 1937 amounted to \$1,632,503.66, an increase of \$60,049.41 over the preceding year. This increase is largely attributable to the application of the Annual Leave Act of March 4, 1936, which affects practically all employees of the railroad. The average number of employees in 1937 was 802, an increase of but 11 over the previous year.

The statistical report shows an operating deficit of \$172,065.90, which includes a loss of \$174,587.92 incurred in the operation of ocean-going vessels between Seattle and Alaska during the period of the maritime strike. Disregarding the figures for the ocean-line operations and considering only the figures covering the operation of the rail and river lines, there was an operating profit of \$2,522.02, which figure included an amount of \$7,448.99 expended during the year from a sum of \$250,000 provided in appropriation act of 1932 for the investigation of mineral and other resources available which will affect railroad tonnage, which amount, if deducted, would show an operating profit of \$9,971.01. Last year the profit was computed as \$9,677.92.

A line change, costing \$128,127.25, was made from mile 53.1 to mile 53.3, to eliminate two deteriorated snowsheds built in 1918 at a cost of \$199,934. This work was started July 21, 1936, and was completed November 25, 1936.

To eliminate 1,188 feet of timber snowsheds in the vicinity of mile 76, work was commenced June 1, 1937, on a line change to cost approximately \$74,931, work to be completed in October 1937.

To protect embankments from erosion, 13,461 cubic yards of rip-rap was placed at various points.

Between mile 49 and mile 58, 11,175 cubic yards of gravel was placed as ballast, and 10,300 cubic yards of gravel was placed in three bridges.

Work was started on remodeling the old warehouse at Healy to provide a messhouse and some sleeping quarters. A house was taken down at Eska and moved to Carlo to be rebuilt for section quarters. The section house at Sunshine was moved to higher ground. The construction of a new cold storage plant, adjacent to the commissary at Anchorage, was begun. The new warehouse at Holy Cross, started last year, was finished.

Concrete pipes were laid under bridges for six culverts between Curry and Gold Creek. The wooden truss spans of Bridge 146.4, over Knik River, were taken down; the material for a new steel bridge, consisting of 10 spans, 80 feet long, was purchased; and seven new piers of creosoted piles were driven. The south two spans of bridge 148.3, over the Matanuska River, were taken down preparatory to being replaced with a new steel bridge.

The addition to the Curry Hotel, started last year, was completed. It connects the hotel with the annex and comprises 12 rooms with private bathrooms, 4 private bathrooms to serve 4 rooms in the main hotel, and 6 multibedrooms without private bathrooms.

From mile 58 to mile 66, the 65-pound steel rails were replaced with 70-pound rails.

The telegraph and telephone pole line was reconstructed for 33.6 miles by replacing native poles with butt-treated cedar poles.

RAIL LINE OPERATING REVENUES

	1937	Increase over 1936	Decrease under 1936	Percent
Passenger.....	\$196,449.72		\$34,702.19	15.0127
Freight.....	1,449,010.51	\$110,689.82		8.2707
Miscellaneous.....	217,308.55	1,064.61		.4923
Total.....	1,862,768.78	111,754.43	34,702.19	4.3149

RIVER LINE REVENUES

Passenger.....	\$8,836.75		\$1,039.55	10.5257
Freight.....	64,894.05	\$14,054.40		27.6445
Miscellaneous.....	19,003.23		3,090.41	13.9877
Total.....	92,734.03	14,054.40	4,129.96	11.9846

RAIL AND RIVER LINE REVENUES

Passenger.....	\$205,286.47		\$35,741.74	14.8288
Freight.....	1,513,904.56	\$124,744.22		8.9798
Miscellaneous.....	236,311.78		2,025.80	.8499
Total.....	1,955,502.81	124,744.22	37,767.54	4.6548

RAIL LINE EXPENSES

Maintenance and operation including replacements	\$1,882,177.33	\$78,178.16					4.3336
	1937	1936	1935	1934	1933	1932	1931
Operating ratio, railroad, percent.....	100.36	100.70	105.61	117.26	122.73	132.09	154.31

RIVER LINE EXPENSES

	1937	Increase over 1936	Decrease under 1936	Percent
Maintenance and operation.....	\$83,997.09	-----	\$938.04	1.1044

	1937	1936	1935	1934	1933	1932	1931
Operating ratio, river line, percent.....	90.57	102.57	94.60	67.23	99.25	103.09	112.46

RAIL AND RIVER LINE EXPENSES

	1937	Increase over 1936	Decrease under 1936	Percent
Including replacements.....	\$1,966,174.42	\$77,240.12	-----	4.0890

RAIL LINE DEFICIT

Maintenance and operation including replacements.....	\$19,408.55	\$1,125.92	-----	6.1584
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RIVER LINE PROFIT

Maintenance and operation.....	\$8,736.94	\$10,862.48	-----	511.0456
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RAIL AND RIVER LINE DEFICIT

Maintenance and operation including replacements.....	\$10,671.61	-----	\$9,736.56	47.7092
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RAIL AND RIVER LINE NET PROFIT

Net profit (expenses of operation of rail and river lines, expenses of miscellaneous operations and uncollectible railway revenues, less revenues of operation and non-operating income), excluding ocean line.....	\$2,522.02	\$19,965.91	-----	114.4578
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OCEAN LINE REVENUES

Passenger.....	\$36,534.25	-----	-----	-----
Freight.....	134,544.62	-----	-----	-----
Miscellaneous.....	33,944.88	-----	-----	-----
	205,023.75	\$205,023.75	-----	-----

OCEAN LINE EXPENSES

Maintenance and operation.....	\$379,611.67	\$379,611.67	-----	-----
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OCEAN LINE DEFICIT

Maintenance and operation.....	\$174,587.92	\$174,587.92	-----	-----
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RAIL, RIVER, AND OCEAN LINE NET DEFICIT

	1937	Increase over 1936	Decrease under 1936	Percent
Net deficit, including operation of ocean line.....	\$172,065.90	\$154,622.01		
Deficit:				
1925.....			\$1,575,139.08	
1926.....			1,017,860.22	
1927.....			839,424.58	
1928.....			799,095.66	
1929.....			916,599.21	
1930.....			1,213,155.78	
1931.....			577,474.24	
1932.....			401,123.92	
1933.....			257,083.73	
1934.....			178,973.33	
1935.....			73,674.66	
1936.....			17,443.89	
1937 (including emergency ocean line).....			172,065.90	
Profit 1937 (excluding emergency ocean line).....			2,522.02	
Total payroll.....	1,632,503.66	60,049.41		3.8188

Appended hereto is a chart showing comparative statement of revenue and expenses of The Alaska Railroad for the fiscal years 1924-37, inclusive.

OPERATION OF OCEAN-GOING STEAMERS

During October 1936, a maritime strike on the west coast tied up commercial shipping operating to Alaska, and as there was danger of a shortage of food supplies and other necessary commodities in the Territory, The Alaska Railroad under authority of an executive order issued by the President on November 17, 1936, chartered two vessels from salmon cannery operators, which with the Office of Indian Affairs' motorship *Boxer* and motorship *North Star*, opened ocean service from Seattle to southeastern and southwestern Alaska ports.

The two vessels which were chartered were not entirely suitable for economical commercial operation, owing to absence of cold storage cargo space and passenger accommodations on one and limited cold storage cargo space and passenger accommodations on the other, but due to the emergency and the lack of more suitable vessels, it was necessary that they be chartered, and minor repairs were made to adapt them to the railroad service. The steamship *Arctic* was chartered at Alameda, Calif., and the steamship *General W. C. Gorgas* at Seattle, Wash.

The motorship *Boxer* was dispatched from Seattle, Wash., on December 6, 1936, with cargo and passengers for southeastern and southwestern Alaska, with a round trip between Seward and Kodiak. The *Boxer* also made two trips to the westward and Aleutian Island points with cargoes brought from Seattle to Seward on the *Arctic* and *General Gorgas* before returning to Seattle.

The steamship *Arctic* loaded cargo at Seattle, Wash., for Seward and way ports, and departed on December 10, 1936, arriving back in Seattle on January 5, 1937. After unloading southbound cargo, the *Arctic* was returned to the owner at Alameda, Calif.

The steamship *General W. C. Gorgas* made two round trips between Seattle, Seward, and way ports, departing from Seattle on December 15, 1936, and January 15, 1937, returning to Seattle on February 9, 1937, and after unloading was returned to owner.

The Office of Indian Affairs' Motorship *North Star* returned from Alaska just prior to Christmas and was made available for the railroad. It was necessary for the railroad to expend \$29,495.53 repairing and equipping this vessel for use before it was sent to southeastern Alaska with passengers and cargo.

The repairs and improvements on the motorship *Boxer* and motorship *North Star* were necessary to place these vessels in seaworthy condition and to meet the requirements of the United States Department of Commerce, and the cost would have to be borne by the Office of Indian Affairs at a later date when required for their service, if the railroad had not done this work.

In order to secure crews for the vessels, it was necessary to employ members of the maritime unions at the salaries paid by the Alaskan salmon packing companies, which were higher than the rate paid by the commercial steamship transportation companies operating to Alaska prior to the interruption.

Another factor which caused an operating loss was the lack of revenues on the return voyages. During the winter months, there is practically no shipping from Alaska to the States, and consequently return cargoes were not available.

The maritime strike was settled February 4, 1937, and the railroad discontinued operation of vessels as soon as they reached their home port thereafter.

The railroad has not had occasion in the past to operate ocean-going vessels in commercial transportation and in submitting the estimates for the operation of the railroad during the fiscal year 1937 no amount was included in anticipation of a loss from this source, which amounted to \$174,587.92.

TRANSPORTATION

Weather conditions during the entire fiscal year were unusually severe. Temperatures during the winter were abnormally cold, and in addition, an abnormal amount of snow fell which in the spring created high waters in all of the streams crossed by the railroad, causing much trouble. Heavy rains during the spring and summer caused many mud and rock slides, and in the southern district more than the normal amount of snowslides occurred.

On March 19, a southbound passenger train derailed on the bridge at mile 85.6. No injuries were sustained by either the passengers or the members of the train crew. The point of derailment was on a 10° curve, and the resulting investigation failed to disclose the cause for

the derailment, the track, bridge, and equipment being in good condition.

New equipment placed in service consisted of one 21-passenger trailer car, to be used in conjunction with the Kalamazoo rail motor car purchased last year, and a coach seating 72 persons, purchased second hand and reconditioned in the Anchorage shops. The steel diner which was undergoing conversion into an observation car at the end of last year, was completed and placed in service in July.

A total of 7,038.22 tons of coal, consisting of 2,010.32 tons sacked coal and 5,027.9 tons bulk coal, consigned to points served by connecting carriers, passed outbound over Seward dock. This is an increase of 255.49 tons in sacked coal and an increase of 46.07 tons in bulk coal, or a total increase of 301.56 tons, as compared with that handled last year.

Canneries located at Anchorage shipped to Seattle via Seward canned salmon amounting to 2,344.6 tons, an increase of 1,135.7 tons over last year.

There also passed over Seward dock 1,251.12 tons of ore from points on the railroad, consigned to smelters in the States, an increase of 810.35 tons over last year and due largely to heavy shipments of antimony ore from the lignite district.

There was an approximate decrease of 886 passengers arriving and departing Seward on regular scheduled steamers this year, as compared to last year, caused by suspension of regular steamer service during the maritime strike.

MAINTENANCE

An average of 339 men were employed during the year in the maintenance of roadway and structures. Employment ranged from a high of 673 employed in June 1937, to a low of 165 employed in December 1936.

Tie renewals totaled 140,727 untreated ties, 48,701 ties more than were placed in the track in 1936.

The retimbering of tunnel 354.7, unfinished at the close of last fiscal year, was completed in December 1936.

An old snow shed at mile 76.5 was torn down and those at mile 76.0 and mile 76.1 were repaired slightly to carry them through the winter of 1936-37, they to be abandoned in favor of a line change, the construction of which was started in June 1937. The south halves of bridges 25.7 and 14.5 were redriven, as were several other trestles. Part of the Seward dock, outside of the buildings, was replanked.

The Lowell Creek flume at Seward was cleaned out and repaired during June 1937, for the War Department.

Miscellaneous maintenance repairs were made to the various bridges, buildings, and other structures. Five regular bridge crews of about

65 men were used throughout the year in this work, supplemented by additional crews of approximately 50 men working for from 1 to 5 months of the year.

Three ditcher crews were used during the summer season, and occasionally at intervals in the winter, clearing slides and performing general work of ditching along the right of way.

Two steam shovels were operated at various times during the year, loading gravel and rock onto cars.

On June 18, 1937, about 1,000 cubic yards of rock broke loose from the top of the face of Curry rock pit and fell into pit, demolishing a steam shovel; no personal injuries were sustained, as the crew was not working at the time.

MECHANICAL

The rolling stock of the railroad was maintained and repaired in the main shops at Anchorage and auxiliary shops at Fairbanks, Healy, Curry, and Seward. All important and heavy maintenance repair work was performed in the Anchorage shops. The average number of employees in the mechanical department during the year was 135 employees.

The reconditioning of one second-hand coach, purchased during the year, was 95 percent complete at the end of June 1937.

MATERIAL

As in previous years, all coal consumed by the railroad was obtained from local mines, 42,160.96 tons being received during the year, comprised of 34,527.81 tons bituminous coal, and 7,633.15 tons lignite coal. Coal issued amounted to 40,164.05 tons, 1,153.61 tons more than last year. The average price per ton paid for coal was \$3.2832, an average increase of \$0.1166 per ton over last year.

During the year, 141,362 standard untreated cross ties were received. Piling to the amount of 34,220 lineal feet was purchased. Cordwood purchased on the Tanana and Yukon Rivers for the river steamers amounted to 1,525 cords.

The value of material on hand June 30, 1937, amounted to \$420,943.17, which is \$60,778.09 less than the balance carried at the end of last year.

CURRY HOTEL

Guest days at Curry Hotel totaled 5,662, a decrease of 97 under the number of guest days for 1936. In addition to the commercial guests, quarters were furnished to trainmen for a total of 3,160 days, an increase of 304 days as compared to last year. The net operating profit for the year was \$41.72, a decrease of \$1,006.83. The cost per meal was reduced from 82 cents per meal to 81 cents per meal. Reduced travel during the period of the maritime strike caused a decrease

in the operating profit for the year 1937, as compared with the preceding year.

COMMISSARY AND MESS HOUSES

The operation of camp mess houses and Anchorage commissary produced a net profit of \$16,060.63 for the year, a decrease of \$6,774.34 under the profit earned in 1936 and due to increased cost of supplies and materials used in the operation of the mess houses, no change being made in the rate charged for meals.

HOSPITAL

Employees were hospitalized at the Anchorage base hospital for 2,475 patient days, compared with 1,912 days last year. The total patient days for all patients, including employees, was 6,358 $\frac{1}{4}$. The total last year was 6,210 $\frac{1}{4}$ days. The deficit from operating the hospital amounted to \$11,544.19, as compared with \$9,632.73 last year, an increase of \$1,911.46.

Employees injured during the course of their employment totaled 279, of which number 118 resulted in no loss of time, 30 in loss of time less than 3 days, 86 in loss of time of 3 days or over and less than 30 days, and 45 in loss of time 30 days or over. Payment on account of beneficiaries under Employees' Compensation Act during the year amounted to \$47,001.59; of this amount \$35,053.88 was paid directly to beneficiaries in cases arising prior to July 1, 1936, and \$10,015.52 to beneficiaries in cases arising during the fiscal year 1937, and miscellaneous expenses to beneficiaries totaled \$1,932.19.

TOURIST TRAFFIC

Tourist traffic continued to increase, which was a result of the favorable publicity given to Alaska through the press and to the advertising campaign in national publications carried on by the railroad jointly with connecting steamship lines and western railroads.

As in the past, there continues three advertised routes to tourists that include as a portion of the journey a trip over the railroad. These are known as the Yukon Circle Tour, Golden Belt Tour, and the All Rail Tour. For the accommodation of those passengers making the round trip, Seattle to Seward and return on the same steamer, a side trip to Anchorage and Palmer was available. At Palmer, busses transport the tourists to the various points of interest.

During both the 1936 and 1937 tourist season, the Alaska Steamship Co. operated four vessels on the Seattle-Seward run, furnishing bi-weekly service.

The American-Yukon Navigation Co. operated one river steamer between Nenana and Dawson during the season of navigation, arriving at Nenana every second week.

AGRICULTURAL DEVELOPMENT

The railroad continued throughout the year to disseminate information on request to prospective settlers. These requests were quite heavy due to the press reports circulated about the Government-sponsored colonization project in the Matanuska Valley. However, but few settlers acted upon the information furnished and located in the railroad belt, due greatly to lack of capital necessary to undertake such a venture, and the further fact that all desirable land in the Matanuska Valley was withdrawn from settlement.

INVESTIGATION AND DEVELOPMENT OF MINERAL RESOURCES

The value of the mineral production increased rapidly and was the main source of revenue of the Alaska Railroad. The mineral production from the area served by the railroad had a value of approximately \$11,000,000 in the calendar year 1936. This is greater than ever before attained. The direct benefit of the railroad to the mining industry is indicated by the fact that in 1923, at the completion of the railroad, the value of the mineral production from this area was one-seventh of the total production of Alaska, while in 1936 it was one-half.

Gold continued to be the chief metal produced, and all of the districts from Seward to Yukon River points were very active. Development of a low grade gold deposit in the Broad Pass district, which may furnish a shipping concentrate, was favorable and will be continued. Approximately 140,000 tons of coal was produced from the Healy River and Matanuska fields—the largest amount ever produced. Approximately 900 tons of antimony ore was mined and shipped to various smelters in the United States, and it is probable that this industry will continue.

The Mining and Geological Department of the Alaska Railroad, in cooperation with the Alaskan branch of the United States Geological Survey, examined mines, prospects, and mineralized areas, and furnished information to a large number of prospectors and developers of mining properties. Approximately 2,000 feet of underground development was completed at the Alaska Railroad's emergency coal mine at Eska, and late in the fiscal year the erection of a small power plant was started. With the completion of this project, the coal requirements of the Alaska Railroad can be met within a few week's notice.

GENERAL REMARKS AND OUTLOOK FOR TRAFFIC IN THE FUTURE

The program of improvements and rehabilitation was continued during the fiscal year 1937, consisting of ditching, bank widening, grade raising, ballasting and replacing wooden culverts with concrete

and corrugated iron pipe, placing rock to protect roadbed against erosion from rivers, streams and tide action, replacing deteriorated wooden bridges with steel bridges, and making line changes to eliminate deteriorated wooden snowsheds.

The Pacific Coast maritime strike in October 1936, resulted in the abrupt and complete severance of commercial shipping between the Pacific Coast and Alaska.

Because of appeals for ocean service from the Governor of Alaska, the Territorial Chamber of Commerce of Alaska, and individual chambers of commerce of the various cities to the President and the Secretary of the Interior, informing of food shortage and other necessary supplies and medicine, the Alaska Railroad, under authority of an Executive order issued by the President, dated November 17, 1936, chartered one ship from a fish canning company to render the service, but as it became apparent that the disruption would be of some duration, another fish company's ship was chartered, augmented by two smaller motorships, the *North Star* and *Boxer* of the Office of Indian Affairs, for service between Seattle and southeastern and southwestern Alaska ports, also Aleutian Islands. The maritime strike ended February 4, 1937, and the Alaska Railroad discontinued operation after the ships reached their home ports.

Due to the fact that no return cargo from Alaska is available during the winter months and that three of the ships were not equipped to handle passengers, and that approximately \$35,000 was expended to recondition the Bureau of Indian Affairs' vessels, the rendering of this service resulted in an operating loss of \$174,587.92.

FINANCIAL

Gross operating revenues for the rail and river lines were \$1,955,502.81, an increase of \$86,976.68, or 4.65 percent, over the comparable figure for 1936. An advance in the cost of material, supplies, and equipment created an increase of \$77,240.12, or 4.08 percent in the operating expenses for the same period. The total for this year amounted to \$1,966,174.42.

The operating profit derived from the rail and river lines amounted to \$2,522.02, an increase of \$19,965.91, or 114.45 percent. The operating profit included an expenditure of \$7,448.99 made during 1937 for investigation of mineral or other resources, which amount, if deducted, would produce an actual operating profit of \$9,971.01. Last year the profit was computed as \$9,677.92.

Passenger earnings in 1937 decreased \$34,702.19, or 15.01 percent. Freight earnings for the same period increased \$110,689.82, or 8.27 percent. The rail-line revenue passengers in 1937 decreased 15,406 in number, as compared with last year, attributable to the cessation

of boat service to Alaska during the period of the maritime strike, also due to the reduction in short-haul passengers. Rail-line freight tonnage handled increased 6,707 tons, and is indicative of the continued improvement in business conditions in Alaska.

The pay roll for 1937 amounted to \$1,632,503.66, an increase of \$60,049.41 over the previous year. This increase is largely attributable to the application of the leave act, which was extended to practically all employees of the railroad.

During October 1936, 5,484.12 tons of scrap iron, an accumulation since 1929, was sold f. o. b. cars Seward, Alaska, to a Seattle concern, for which the railroad received \$50,855.68, also \$4,977.58 for loading cost on the ship at Seward. This transaction created earnings for employees of the Alaska Railroad in the amount of \$25,590.48, and the railroad a profit of \$30,242.78.

The act approved June 29, 1936 (Public, No. 836, 74th Cong.), provided for retirement of employees of the Alaska Railroad, Territory of Alaska, who are citizens of the United States, except clerical employees who are made subject to the Civil Service Retirement Act. During the year, 43 employees were retired because of age and 3 because of disability.

During May 1937, the railroad received an allotment of P. W. A. funds amounting to \$730,000 for the construction of a steel bridge over Knik River; making line change from mile 75.8 to mile 76.3; ballasting roadbed; construction of four section-gang houses; completion of gravel fill on pile trestle approach at the south end of Nenana River bridge; and the construction and equipping of a hotel and necessary utilities and outbuildings to accommodate tourists to Mount McKinley National Park.

OFFICE OF SOLICITOR

Nathan R. Margold, *Solicitor*

THE tasks of the immediate staff of the Solicitor included the representation of the Secretary of the Interior in litigation in the courts of the District of Columbia, the drafting of proposed legislation and reports thereon, the representation of the Department before congressional committees, the preparation of land decisions and departmental opinions and findings, the handling of legal features of Indian reorganization, and the review and other disposition of all other legal matters.

During the past year the Solicitor has represented the Secretary of the Interior in various actions contested in the courts of the District of Columbia. The Department has prevailed in all cases that came on for hearing during the past year, one in the court of appeals, and four in the district court. Three of these controversies concerned public lands; the other two involved Indians. The Solicitor and his staff have also assisted the Department of Justice in the prosecution and defense of actions in other courts.

In the United States District Court for the District of Columbia, 19 war minerals relief cases were disposed of by dismissal or by entry of consent decrees. There remain of record in that court 59 war minerals relief cases, the disposition of most of which is delayed by reason of the failure of claimants' attorneys to furnish necessary data. Numerous cases are still pending in the War Minerals Relief Commission, which, when disposed of, will be reviewed by the Solicitor's staff.

A quantitative summary of the work, exclusive of litigation, is set forth in the following table:

	Land decisions	Opinions of Solicitor	Indian matters	Miscellaneous matters ¹	Totals
Pending July 1, 1936.....	436	233	135	273	1,077
Received during the year.....	695	679	7,312	10,359	19,045
Total.....	1,131	912	7,447	10,632	20,122
Disposed of during the year.....	783	561	7,324	10,510	19,178
Pending June 30, 1937.....	348	351	123	122	944

¹ "Miscellaneous matters" include such transactions as the following: Contracts for the erection of buildings, road construction, supplies, etc.; reports on legislation; grants, transfers, and cancelations of mineral leases and permits; contracts with irrigation districts; grants and acquisitions of rights-of-way for power lines and for ditches and canals; withdrawals and restoration of lands; determination of power rates.

There is a decrease in the number of land appeals, due to the smaller number of routine matters—stock-raising homestead cases and ceded Indian lands cases—received during the past year. Non-routine cases continue their usual heavy volume.

Requests for formal opinions of the Solicitor continue to increase in number. In the year just past 679 requests for opinions were received, an increase of 189 over the submissions of the preceding year; and 561 formal opinions were rendered, as contrasted with only 334 during the preceding year. Of the opinions rendered in the fiscal year 1937, 333 were title opinions and 164 involved accident claims, as against 99 and 156, respectively, during the preceding year. At the close of the present year there were still 210 title cases pending in the Solicitor's Office, but a procedure has been devised to speed up this work in the future by stationing title examiners in the field to conduct the preliminary examinations.

In addition to these special categories, requests for opinions have covered the usual broad range. The most notable trend of the past year seems to be that the submissions to the Solicitor no longer reflect the addition to the Department of new bureaus or activities, but involve new questions arising in the course of administering existing agencies and functions. The following subjects are typical of the requests that were received and acted upon in the course of the year:

Power of the Secretary to grant and forfeit hot-water privileges at Hot Springs National Park under the act of March 3, 1891.

Nature and extent of the right of the United States, under the Boulder Canyon Project Act and the contract of December 1, 1932, with the Imperial irrigation district, to the net proceeds of any power development on the All-American Canal, in relation to the security for loans proposed to be made to the district by the Public Works Administration and the Rural Electrification Administration.

Authority of the Secretary to reserve waters for the natives of Alaska to protect their fishing rights.

Eleven questions relating to the interpretation of the Mineral Leasing Act of February 25, 1920, with particular reference to problems of lease royalties and issuance of leases in connection with unit plans.

Authority of the Department to limit the issuance of grazing privileges to a portion of the applicants within the preference class relating to section 3 of the Taylor Grazing Act, where the range within a grazing district is insufficient to provide for all applicants within the class.

Right of State game wardens to enter upon restricted Indian reservation lands.

Whether the act of March 3, 1891, bars a suit to reform homestead patents issued more than 6 years previously without reservation of minerals, where existing law required such reservation to be made.

Right of Indians and Indian Pueblos to enjoy equal consideration with other persons in the granting of grazing privileges under the Taylor Grazing Act.

Applicability of the Coatwise Load Line Act and the Convention for Safety of Life at Sea to boats operated by the Department between Seattle and Alaskan ports.

Whether the lands embraced in the various Mission Indian reservations in California remain in tribal ownership until trust patents have issued to allottees, and whether, prior to the issuance of such trust patents, Congress may abandon the distribution in severalty and adopt some other mode of distribution.

Whether the rates under section 5 (a) of the Boulder Canyon Project Act can be fixed as required by competitive conditions without regard to the general project financing requirements, if the rates called for by competitive conditions at the first or later readjustment should be insufficient to finance the project cost under the first sentence of section 5 of the act.

Special mention should be made of certain extended opinions prepared in the Solicitor's Office, two of them involving complicated questions under the amendatory War Minerals Relief Act of May 18, 1936, the other consisting of data prepared for the Secretary in connection with his decision on the complaint of the State of Nebraska against the construction placed by the Bureau of Reclamation on contracts made under the Warren Act between the United States and private irrigation districts on the North Platte River for the sale of surplus water from the Pathfinder Reservoir.

Many of the legislative measures sponsored by the Department at the first session of the Seventy-fifth Congress involved highly controversial issues and resulted in lengthy hearings which required extensive research and preparation as well as numerous appearances before congressional committees by the legislative specialists attached to the Solicitor's staff. Few of the measures sponsored by the Department were acted upon before the close of the fiscal year, due to delay in the general legislative program, but mention should be made of the following bills, supported by the Department, which progressed to final passage:

A bill (S. 1567) to provide for the production, conservation, and sale of helium gas by the Federal Government, and authorizing the acquisition of properties for the production thereof.

A bill (H. R. 7618) changing the policy of administration of the revested Oregon and California Railroad and reconveyed Coos Bay Wagon Road grant lands by authorizing the Department to carry out a program of sustained-yield management, and adjusting the distribution of receipts from said lands.

A bill (H. R. 5394) providing for the acquisition and subsequent addition to the Yosemite National Park of approximately 7,000 acres of virgin sugar pine timber.

Two bills (S. 2092 and H. R. 7642) to authorize the completion, maintenance and operation of the Bonneville Dam project on the Columbia River.

A bill (S. 1722), known as the "reindeer bill", to establish a permanent and self-sustaining economy for the Eskimos and other natives of Alaska by promoting native ownership and activity in the reindeer industry.

A bill (S. 2172) to prevent speculation in lands in the Columbia basin prospectively irrigable under the Grand Coulee project.

As in previous years, the drafting of regulations necessary to implement the many and varied statutes under which the Department operates has constituted an important part of the work of the Solicitor's Office. Among those deserving special mention may be cited the following:

Rules of procedure for the conduct of hearings and appeals from decisions of regional graziers denying such applications for grazing appeals under the Taylor Grazing Act.

Regulations of the Indian Arts and Crafts Board for the promotion of sales of genuine Indian products.

Regulations for credit operations under the Indian Reorganization Act and the Oklahoma Indian Welfare Act.

Regulations relating to oil and gas leases for lands within the boundaries of a unitized area, issued subsequent to the approval of the unit agreement for such area.

The work of the legal sections of the General Land Office and of the Geological Survey has increased progressively with the administration of oil- and gas-conservation measures, particularly with respect to the negotiation, drafting, and final approval of unit plans for particular oil and gas fields. Once again it is noted that, notwithstanding the blanket Executive order withdrawals of November 26, 1934, and February 5, 1935, there is as yet no diminution in the work coming from the Homestead Division of the General Land Office. This is accounted for by the fact that the withdrawals have been modified by subsequent Executive orders and by legislation, which have restored certain privileges under the public-land laws and also created new rights and privileges. Moreover, the modification and amendment, respectively, of the Executive order of November 26, 1934, and section 7 of the Taylor Grazing Act, by the act of June 26, 1936, has created a new class of business with resultant miscellaneous inquiries and applications for classification opening and entry.

The important business of administering the estates of deceased Indians, other than members of the Osage Tribe or of the Five Civilized Tribes, is handled by a staff which is still numerically inadequate despite improved organization and administrative procedure. Indian probate cases are currently a year behind, notwithstanding that the examiners completed, during the past year, 1,712 new cases and 47 rehearings. In this connection it should be pointed out that the

appraised value of the 1,712 estates reported by the examiners of inheritance was \$3,208,229.46. The probate fees on these estates, amounting to \$43,495, were covered into the Treasury. The probate fee in the average case is about \$25, and the average examiner can complete some 200 cases a year. This means that each examiner earns for the Government about \$5,000 a year. Yet the highest salary paid an examiner is \$3,000, and the proposed salary of the additional examiner, allowed by the Budget for 1938 but stricken out by Congress, was only \$1,800.

The work of the probate attorneys in Oklahoma assigned to assist the Indians of the Five Civilized Tribes continues to show improvement, as evidenced by expressed satisfaction on the part of many Indians, and complaints from those whose interests lie in exploitation. Closer liaison with the Department's Division of Investigations has materially aided the work of these attorneys. During the past year, the Oklahoma probate attorneys made 1,615 court appearances in cases involving property worth in the aggregate \$5,481,480.50. They participated in 418 deed and lease approvals, resulting in a saving to the Indians of \$334,128.97. The supervising probate attorney in Oklahoma approved attorney's fees, in individual amounts of more than \$100, totaling in the aggregate \$66,307.17.

The most notable feature of the year at the Osage Agency has been a check on guardianship matters there, initiated by the Osage tribal attorney, which disclosed laxities and discrepancies in many guardians' accounts. As a result steps are now being taken whereby the Osage Tribe will employ a competent auditor, who is also an attorney at law, who will currently check all Osage guardianships and thereby prevent overpayments or improper disposition of funds.

The legal staff attached to the Indian Irrigation Service has, at the request of the local United States attorney, prepared the appeal and briefs in the important water-right case of *United States v. Powers*, now pending in the Circuit Court of Appeals for the Ninth Circuit. The ultimate decision in that case will affect practically every Indian irrigation project in the country.

During the year emphasis in the work of Indian organization has shifted from the interpretation of the basic act, the issuance of regulations thereunder, and the approval of constitutions and charters, to the final task of assisting the Indian tribes in the actual carrying out of the powers vested in them by virtue of these documents. This has involved a continuous process of advising Indian tribes as to the extent of their powers, assisting them in the preparation of the many legal forms needed in carrying out their programs, and has also involved the problem of adjusting to the new order the procedure and routine of the Indian Office itself. Credit operations under the Alaska

Reorganization Act and the Oklahoma Indian Welfare Act have been initiated during the past fiscal year, necessitating the preparation by the legal staff of loan agreements, mortgages, and other incidental documents. Meanwhile the work of drafting constitutions and charters for tribes as yet unorganized has continued. During the fiscal year 1937 the Department's law officers considered 55 constitutions and 48 charters of incorporation for Indian tribes, of which 24 and 33, respectively, were finally approved.

The work of the Bureau of Reclamation has continued to require extensive legal services in Washington and in the field. Attorneys in the Washington office approved construction and supply contracts involving an aggregate expenditure of \$22,553,571.99. In the field the fiscal year 1937 was marked by the final execution of the Truckee River Agreement, involving the regulation of water to be released from Lake Tahoe; and the drafting of the complicated contracts and mortgages necessary in connection with the repayment scheme for the Provo River project. Counsel for the Bureau of Reclamation prepared the briefs and made the arguments in the cases involving the land condemnation cases at Grand Coulee Dam, cases which involved the proper measure of damages to be paid for the property needed for the project. The appellate court sustained the position of the Government, with a resultant saving of many millions of dollars.

DIVISION OF INVESTIGATIONS

B. B. Smith, *Director*

THE principal work of the Division of Investigations during the last fiscal year was the investigation of cases involving public lands, especially the protection of public lands and the timber thereon from fraudulent entry and appropriation. Considerable work was necessary in the investigations of applications to lease under section 15 of the Taylor Grazing Act, it being necessary to obtain facts concerning the qualifications of applicants, live stock operations, water supply, prior use of lands, character of lands, carrying capacity, conflicts, improvements, lands leased from State and railroad, and rental value of lands. Complete sets of maps were prepared covering the status of all lands in the grazing districts. These maps not only portrayed the land office status but data was obtained showing the State and railroad lands leased, and lands owned by each applicant for a lease. Investigations were made involving State land exchanges, leases, isolated tract applications under the Taylor Grazing Act, homestead entries, final proofs, desert land entries, coal and timber trespass, mineral applications including oil and gas leases, State lieu selections, unlawful inclosures and irrigation projects.

On July 1, 1936, there were pending 7,295 field investigation cases. During the year 10,492 new cases were received; 7,890 cases were investigated, reported and closed leaving 9,897 pending investigations. Of the 9,897 pending investigations 2,773 are grazing leases under section 15 of the Taylor Grazing Act.

The following criminal and penal code violation cases were investigated during the fiscal year ended June 30, 1937:

Embezzlement.....	3
Fraudulent final prooof.....	1
Incendiary fires.....	2
Fraud sale oil and homestead lands.....	1
Fraud acquisition public lands.....	1

Perjury.....	1
Theft of Government property.....	1
Unlawful inclosure.....	1
False representation, employment.....	1
Grazing trespass.....	6
Timber trespass.....	20

Thirty-one persons were indicted during the year, twenty convicted, and two fined. Eleven cases are pending action.

Classification of railroad lands was made in several cases to determine whether or not the lands selected were actual mineral bearing in fact, and as a result thereof 88,000 acres with an appraised value of \$100,000 was classified as mineral and eventually will be saved by the Government.

Attention has been given to, and investigations and reports made in connection with, coal leases concerning which the lessees have become delinquent in the payment of royalties. A number of lessees have submitted plans of reorganization to various United States district courts involving the National Bankruptcy Act. Where plans were filed, investigations were made to determine if the interests of the United States were properly protected. Assistance was rendered the Department of Justice in connection with these hearings before the United States district court in reference to the proposed plans for reorganization, and also with reference to the cancellation and collection of royalties. In one division these activities resulted in the cancellation of two coal leases and the collection in royalties of \$8,738.

One of the most important cases now pending is that involving the liability of a coal company covering coal mined on land recovered after an erroneous sale by the State. The Government's claim in this case amounts to approximately \$300,000.

Due to the results of field investigations \$12,375.17 was turned into the United States Treasury, and 272,285.46 acres, representing fraudulent entries, etc., were cancelled and restored to the public domain. The acreage restored to the public domain, estimated at the minimum value of \$1.25 per acre, represents a saving to the Government of \$340,355.57.

Audits were made of Indian agencies and guardianships as well as concessionaires operating under contract in the various national parks and national monuments.

Many hearings were conducted in behalf of the United States by the special agents in charge of hearings, based upon investigations and reports submitted by the investigators, resulting in the restoration to the public domain of thousands of acres of lands in cases where fraudulent final proofs were attempted and the law not complied with.

PERSONNEL

The number of special agents as of June 30, 1937, employed in the Division was 79, of which number 64 were regular special agents and 11 were paid from emergency funds, and 4 temporary agents. In addition to the special agents there are 4 special agents in charge directing the special agents, under the supervision of the Director, at offices in Albuquerque, N. Mex., Billings, Mont., Salt Lake City, Utah, and San Francisco, Calif. A new field office was established with headquarters in Washington, D. C. The total force employed, including the Director, Assistant Director, reviewer, and clerks was 119.

WAR MINERALS

RELIEF COMMISSION

Roscoe Fertich, *Commissioner*

I. ACT OF FEBRUARY 13, 1929 [45 STAT. 1166]

THE Secretary of the Interior made two awards totaling \$3,020.03, and denied four claims under decree, during the fiscal year ending June 30, 1937.

An appropriation for payment of awards was made in the Treasury Deficiency Appropriation (Public, No. 121, 75th Cong., approved May 28, 1937) for \$22,915.36. This amount included six awards aggregating \$21,395.33, certified during the previous fiscal year, and which have been paid; and one award for \$1,520.03, which was certified during the fiscal year under report, is unpaid, pending attachment proceeding against the Secretary of the Treasury.

The other award, for \$1,500, certified during this fiscal year, is pending a future Treasury deficiency appropriation.

IN THE DISTRICT COURT OF THE UNITED STATES IN THE DISTRICT OF COLUMBIA

Seven cases were dismissed by the court for the reason that the corporations or partnerships had been dissolved before the petitions for review were filed under the act of February 13, 1929, and were not legally capable of maintaining a suit.

Seven decrees were entered during the fiscal year by that court, authorizing the Secretary of the Interior to review his previous decisions on matters of law.

Record of Cases Filed Under the Act as Amended Feb. 13, 1929

Total cases filed.....			348
Total cases dismissed by the District Court of the United States in the District of Columbia.....		76	
Decisions by the Secretary of the Interior:	<i>Awards</i>	<i>Denials</i>	
To June 30, 1936.....	165	20	
July 1, 1936, to June 30, 1937.....	2	4	
	167	24	191
Cases pending in the District Court of the United States in the District of Columbia.....			58
Decrees by District Court for the United States in the District of Columbia, pending in W. M. R. C. June 30, 1937			23
			348 348

UNDER THE ACTS AS AMENDED IN 1936

Under the acts of 1936, 336 petitions for review have been filed.

Sixteen petitions for review under either or both of the 1936 acts have been rejected, as follows: denied under decree, no admissible loss found, 9; dismissed by court, no error in law by the Secretary of the Interior, 4; not identifiable with any claim filed under the act of March 2, 1919, 1; pending in court, filed under the act of 1929, 2.

II. ACT OF MAY 18, 1936 (49 STAT. 1355)

The Secretary of the Interior, when authorized by the District Court of the United States for the District of Columbia, will reopen previous decisions to consider the item of interest paid or accrued to the date of approval of this act, and makes awards for losses proven to his satisfaction to be allowable within the meaning of the relief act of March 2, 1919.

Eighty-nine petitions for review of loss by interest have been filed. Sixty-nine cases have been accepted for review of claim; the other 20 petitions were rejected as ineligible for the reason that a review of the item of interest is not directed in the decree from the court.

Three awards, totaling \$740,412.11, were made by the Secretary of the Interior during the fiscal year.

This act set a limitation of \$1,250,000 for the purpose of paying claims under this amendment. An appropriation of \$500,000 (49 Stat. 1619, June 22, 1936) has been disbursed; the first two awards exceeded the appropriation by \$132,428.02.

Public, No. 121, Seventy-fifth Congress, approved May 28, 1937, appropriated an additional \$650,000 for payment of interest claims in accordance with the act approved May 18, 1936 (49 Stat. 1355).

A third award, \$107,984.09, was made; of this amount \$65,136.02 has been paid by the Secretary of the Treasury.

The above balances of awards, for \$132,428.02 and \$42,848.07, totaling \$175,276.09, have been reserved by the Secretary of the Treasury.

There is a balance of \$409,587.89 available to pay further awards under the interest act.

III. ACT OF JUNE 30, 1936 (49 STAT. 2040)

This act authorized claimants who failed to file suit under the 1929 amendment of the relief act, or whose suit so filed was abated by the court, to petition the Secretary of the Interior to review their claims as a matter of law in the light of decisions of the court in similar cases, and to make awards; and provided for the rights of deceased claimants to descend to their legal successors; and provided for the rights of dissolved corporations to descend to any officer, director, stockholder, or legal representative who shall be entitled to the benefits of this act; provided, that such claims be filed within 6 months of approval of the act.

Under this act, 231 petitions for review were filed within the time limit. The status of these petitions is as follows:

Accepted for review.....	133
Pending authority to file claim.....	14
Suits abated by court; grounds for reopening not established.....	22
In court under the act of Feb. 13, 1929, pending decision as to right of petition under the act of June 30, 1936.....	55
Withdrawn by attorney.....	7
	<hr/>
	231

Public, No. 121, Seventy-fifth Congress, approved May 28, 1937, appropriated \$100,000 for payment of claims in accordance with this act.

Four awards, totaling \$43,883.84, were made by the Secretary of the Interior during the fiscal year. These awards have been paid by the Secretary of the Treasury.

\$56,116.16 is available for further awards.

NOTE.—The number of petitions for review filed under the acts of May 18, and June 30, 1936, greatly exceeds the number expected would be filed. As provided by the act of June 30, 1936, the time limit for filing has expired; no additional petitions can be filed. Under the act of May 18, 1936, there is no time limit; a few more petitions may be expected.

DIVISION OF MOTION PICTURES

Fanning Hearon, Director

THE Division of Motion Pictures continued to produce and distribute motion and still pictures of the Department's activities.

Motion-picture production featured the most ambitious film the Department has attempted, *Price of Progress*, dealing with the destruction and conservation of natural resources; three Indian pictures; a presentation of the rehabilitation of the Virgin Islands; one on Boulder Dam and one on the Bureau of Reclamation in general; a story of the Ohio-Mississippi flood, and the beginning of a film record of Grand Coulee Dam. There were several others on national and State parks, the Civilian Conservation Corps and related subjects, making a total of 30 reels a year at a cost of \$1,700 each.

These subjects and others produced by the Department in previous years are distributed at the rate of 500 shipments per week to theaters, colleges, schools, C. C. C. camps, and interested institutions, organizations, and groups. Audience estimates indicate 4 million persons saw the Department's films during the year.

Still picture contributions of the year were coverage of the Indian reservations, pictorial records of several proposed national parks and monuments, a national park winter sports series, continuance of work on Bureau of Reclamation projects, and probably the first complete photographic presentation of historical Fort Jefferson in the Gulf of Mexico.

An innovation was the inauguration of weekly motion-picture shows of Department films in the auditorium.

In the course of the year the Division's first Director, Mr. Ellsworth C. Dent, resigned and was replaced by Mr. Fanning Hearon, formerly of the National Park Service.

OFFICE OF EXHIBITS

G. C. Dickens, *Supervisor*

GOVERNMENT participation through exhibits in State, national, and international expositions, and at numerous scientific and otherwise educational conventions, has become an established policy. One important function of all Government departments and independent establishments should be to acquaint the general public insofar as possible with the many and varied activities and services being carried on by them.

Experience has proved that one of the best methods is provided by participation in expositions and the other gatherings above described. In carrying on this work the use of motion pictures, animated dioramas and models, stereopticon slides and colored transparencies, and murals has proved to be highly successful and adaptable. Further, in making presentations relating to our island and territorial possessions and the American Indian, experience has developed that the display and use of native handicraft is both desirable and important.

With the appointment of a Supervisor of Exhibits by the Secretary of the Interior under date of February 1, 1936, an Office of Exhibits under the Secretary's Office was established. The Supervisor of Exhibits has supervision over the Department's exhibits at the Greater Texas and Pan American Exposition, the Paris Exposition, and the Great Lakes Exposition. Further, the Office of Exhibits, through its diorama and model studio, is constantly at work preparing additional and new exhibit material, and is already making preliminary and tentative plans relating to the forthcoming Golden Gate International Exposition, the New York World's Fair, and the proposed expositions in Los Angeles, Oklahoma City, and Tampa.

Further, for distribution at the Department's exhibits the Office of Exhibits compiled, with the assistance of the various bureaus, the Public Works Administration, and the National Resources Committee, a booklet entitled, "Back of the Buffalo Seal", which contains printed matter and pictures descriptive of the work of the several organizations which are under the jurisdiction of the Secretary of the Interior.

BOARD ON GEOGRAPHICAL NAMES

George C. Martin, *Executive Secretary*

THE United States Board on Geographical Names is the organization through which the Government provides for uniformity in the use of geographic names on maps and in publications issued by the Federal Government.

The Board is essentially a cooperative organization. In it the Department of the Interior furnishes administrative and investigative facilities through which representatives of various governmental departments that make and use maps, and of geographic societies, determine policy in the use of geographic names and render decisions on names submitted for decision.

The Board consists of an advisory committee, on which various Government Departments and geographic societies are represented, which acts chiefly through its executive committee; and of an administrative and investigative unit, the Division of Geographic Names, in the office of the Secretary of the Interior. The personnel of the advisory and executive committees, on June 30, 1937, was as follows:

ADVISORY COMMITTEE

Mr. CLARENCE BATSCHELET, Geographer, Bureau of the Census, Department of Commerce.

Mr. ALBERT H. BUMSTEAD, Chief Cartographer, National Geographic Society.

Mr. E. E. CARTER, Assistant Forester, United States Forest Service, Department of Agriculture.

Dr. WILLIAM H. HAAS, Professor of Geology and Geography, Northwestern University, representing the Geographic Society of Chicago.

Dr. J. N. B. HEWITT, Ethnologist, Bureau of American Ethnology, Smithsonian Institution.

Lt. Col. LAWRENCE MARTIN, Chief, Division of Maps, and Incumbent, Chair of Geography, Library of Congress.

Dr. W. C. MENDENHALL, Director, United States Geological Survey, Department of the Interior.

Mr. RAYE R. PLATT, Secretary, American Geographical Society of New York.
 Mrs. SOPHIA A. SAUCERMAN, Assistant Geographer, Department of State.
 Commander FRANCIS P. TRAYNOR, Officer in Charge, Division of Maritime Security, Hydrographic Office, Navy Department.
 Lt. Col. LEWIS H. WATKINS, G. S., Chief, Geographic Branch, Military Intelligence Division, War Department.
 Mr. CHARLES C. WENRICH, Assistant Deputy First Assistant Postmaster General and Chief Clerk, Post Office Department.
 Dr. FRANK E. WILLIAMS, Professor of Geography, Wharton School of Finance and Commerce, University of Pennsylvania, representing the Geographical Society of Philadelphia.

EXECUTIVE COMMITTEE

Dr. W. C. MENDENHALL, *Chairman*

Lt. Col. LEWIS H. WATKINS

Mr. E. E. CARTER

The advisory committee held 3 meetings during the year and the executive committee held 13 meetings at which 410 names were approved. The locations of the features thus named, and the organizations which submitted the names for decision, were as follows:

Geographic Distribution of Names

Alaska.....	92	Montana.....	8	North Dakota.....	2
Wyoming.....	67	Arizona.....	6	Massachusetts.....	1
New York.....	47	Maine.....	6	New Mexico.....	1
Alabama.....	34	Connecticut.....	5	South Carolina.....	1
Utah.....	29	Georgia.....	4	West Virginia.....	1
Washington.....	26	Michigan.....	3	Puerto Rico.....	1
Oklahoma.....	24	Mississippi.....	3	Virgin Islands.....	1
California.....	23	Nebraska.....	3		—
Virginia.....	10	Louisiana.....	2	Total.....	410
Minnesota.....	8	New Jersey.....	2		

Organizations Requesting Decisions

National Park Service.....	145	United States Forest Service.....	16
United States Hydrographic Office.....	66	War Department.....	4
United States Geological Survey.....	53	Soil Conservation Service.....	3
United States Coast and Geodetic Survey.....	50	State organizations.....	3
Bureau of Chemistry and Soils..	40	Bureau of Biological Survey.....	2
Societies and individuals.....	25	Miscellaneous.....	3
		Total.....	410

ADVISER ON NEGRO AFFAIRS

Robert C. Weaver, *Adviser*

SECURING for Negro citizens participation in the programs of the Department of the Interior, Public Works Administration, and associate agencies is the function of the office of Adviser on Negro Affairs. To this end a definite line of action has been devised which follows fairly closely the following outline:

1. *Interviews.*—*a.* With persons seeking employment in the Department of the Interior and the Public Works Administration.
- b.* With persons seeking to improve their status in the Department.
- c.* With departmental executives seeking information and advice on Negro personnel problems.
2. *Consultation.*—*a.* With Housing Division officials on matters pertaining to Negro participation on housing projects.
- b.* With administrative officials relative to complaints, requests, and suggestions from Negro employees in the Department.
3. Field investigation trips concerning matters of Negro skilled and unskilled labor on Public Works Administration housing and nonhousing projects.
4. Field trips and investigations into matters concerning Negro participation in recreational facilities provided by the National Park Service.
5. Trips to various centers of Negro population to make speeches and to consult with groups to acquaint them with the work the Department is doing.
6. Miscellaneous activities such as administering white-collar survey, consulting with the President's Committee on Vocational Education, and preparing for publication news releases and articles designed further to enlighten the American reading public on the part Negroes are now playing in the affairs of the Government, with special emphasis laid on the Department of the Interior and the Public Works Administration.

The highlights of the activities of the Adviser on Negro Affairs during the last year fall chiefly into the classifications of consultations and field investigations. Since June of 1936 either the Adviser on Negro Affairs or the Associate Adviser on Negro Affairs has visited at least 40 of the 50 housing projects now in process of construction. These visits had to do with matters of labor, which include meeting with union officials, labor groups of both races, leaders in communi-

ties, and sometimes with city and district government officials. In all cases there was but one motive in view, and that was to secure the participation of Negroes in the program of construction as well as the program of tenancy with as little friction as was possible. Some figures taken from the summaries of 10 field reports submitted by Dewey R. Jones, Associate Adviser, show to what degree these efforts have been successful. Of the total money spent for labor on Public Works Administration housing projects the following percentage was paid to Negro skilled and unskilled labor: On Riverside Heights in Montgomery, Ala., 27.4 percent to skilled and semiskilled, and 90.3 percent to unskilled; William Patterson Courts, also in Montgomery, Ala., 26.5 percent to skilled and semiskilled, and 86.2 percent to unskilled; Durkeeville in Jacksonville, Fla., 25.4 percent to skilled and semiskilled, and 90.1 percent to unskilled; Liberty Square in Miami, Fla., 4.8 percent to skilled, 10.1 percent to semiskilled, and 65.8 percent to unskilled; Techwood in Atlanta, Ga., 20 percent to skilled, 23.8 percent to semiskilled, and 72.6 percent to unskilled; University Homes, also in Atlanta, Ga., 20 percent to skilled, 13.1 percent to semiskilled, and 82.7 percent to unskilled; Jane Addams Houses in Chicago, Ill., 3.7 percent to skilled, and 14.9 percent to semiskilled and unskilled; Blue Grass Park in Lexington, Ky., 11.8 percent of skilled, 50.9 percent of semiskilled, and 49 percent of unskilled; Laurel Homes in Cincinnati, Ohio, 3.2 percent of skilled, 15.2 percent of semiskilled, and 68.5 percent of unskilled; University Terrace in Columbia, S. C., 35.05 percent of skilled and semiskilled, and 94.65 percent of unskilled.

The office of Adviser on Negro Affairs has been in constant touch with the situation at Grand Coulee Dam, and has advised with officials there as well as with Negro labor groups in order to secure for Negroes the right to work on this project. This was felt necessary in view of the unfavorable criticism to which the Department of the Interior was subjected as result of its failure to take similar steps in the construction of Boulder Dam. This office was directly responsible for the first Negro being employed at Coulee Dam, and has since kept in touch with that situation to insure the continued employment of qualified Negroes.

During the last year the Adviser on Negro Affairs has participated in the dedication of housing and other Public Works Administration projects. He has taken an active part in assisting the Director of Personnel for the Public Works Administration in his effort to secure for managerial and custodial positions in housing projects the best possible material available from those groups the projects were designed to serve.

In his capacity as administrator of a \$470,000 survey of the training and employment of Negro white-collar and skilled workers the Adviser

on Negro Affairs has busied himself within recent months in supervising the editing of a printed report to be submitted to the Secretary of the Interior.

As consultant to the President's Committee on Vocational Education the Adviser on Negro Affairs supervised a study conducted by Prof. D. A. Wilkerson of Howard University, which shows in graphic form the degree to which Negroes have benefited or have not benefited from Federal funds spent on education. The Adviser on Negro Affairs is carrying a similar study still further, to be submitted to the President's enlarged and permanent committee on education for its final report.

The activities of the Adviser on Negro Affairs have been many and varied, but at no point have they been lacking in interest or, it is hoped, in usefulness both to the Department and to the people for whom the office was created.

ST. ELIZABETHS HOSPITAL

Roscoe W. Hall, M. D., *Acting Superintendent*

IN reviewing the events of the past year, the present conditions and the future needs of the hospital, possibly above all else we are confronted with the passing of Dr. William Alanson White who died March 7, 1937, after a third of a century of faithful and distinguished service as superintendent of the hospital. Appointed in 1903 during the administration of President Theodore Roosevelt, from the time of taking up his duties as a young physician of 33 to within a week of his death, after he had risen to national and even international fame, he worked with untiring zeal, patience, and devotion in the upbuilding of the hospital as an institution representative of the best that medical science could offer in the care and treatment of patients with mental and nervous diseases. Friend and protector of patient and employee, inspiring teacher and coworker, he brought to the solution of the daily problems of administration great knowledge, broad tolerance and undaunted courage. The welfare of the patients as the prime objective, insistence on nonrestraint, encouragement of the members of his staff in advancing in the knowledge of their profession while at the same time giving them freedom in the choice of the means to this end, were cardinal principles in the formation of his policies. He encouraged the patients to look to him for help in easing their suffering and relieving their fears. His service and influence reached far beyond the confines of the hospital. He constantly strove to uphold and further in the minds of the public the idea that the hospital for mental diseases is an institution for the healing of the sick and the solution of the problems of the maladjusted rather than an institution of the asylum type. In the words of a fellow physician: "As teacher, author, publisher, and practicing psychiatrist he wrought much influence on institutional policies, psychopathological concepts, and developing attitudes toward mental and nervous disease. Wherever the voice and pen of this great teacher have brought light, there one

perceives the best that modern psychiatry has to offer a troubled world."¹ The Secretary of the Interior appointed Dr. Roscoe W. Hall as acting superintendent of the hospital on March 8, 1937.

Dr. Herbert C. Woolley, first assistant physician, resigned February 1, 1937, and a vacancy exists in this position.

The vacancy that existed in the position of clinical director for the women's service was filled by the appointment of Dr. Evelyn B. Reichenbach, formerly of the Rochester State Hospital, Rochester, N. Y.

INSULIN SHOCK TREATMENT

For many months consideration has been given to the insulin shock treatment for dementia precox, but because of the dangerous and uncertain factors attendant upon this treatment the attitude of the hospital toward its adoption has been a conservative one. However, in view of continued favorable reports it has been decided to use this form of therapy in certain selected cases. To this end several physicians and nurses of the hospital staff were sent during the month of June to observe the use and effects of this treatment at Bellevue Hospital, New York City, and at Harlem Valley State Hospital, Wingdale, N. Y.

In the laboratory a method for determining phosphatase activity in blood has been worked out; also a new method for colorimetric evaluation of bromides in serum.

The collection of electrocardiograms was critically reviewed and a report on serial studies of cardiac arrhythmias prepared.

In addition to the lectures and clinics in psychiatry, psychology, and other subjects given by Dr. William A. White, Dr. Roscoe W. Hall, and the members of the hospital staff to several local universities and medical schools, the following lectures were delivered before the medical staff by visiting scientists:

October 31, 1936: *Les Obsessions*, Professeur Pierre Janet, Membre de l'Institut et Professeur College de France, Paris.

November 14, 1936: Psychopathology, Dr. Edward J. Kempf, Wading River, N. Y.

February 22, 1937: Hypoglycemic Therapy, Dr. Manfred Sakel, Clinic for Psychiatry and Neurology, University of Vienna, Vienna, Austria.

March 13, 1937: Effect on the Spinal Fluid of Various Anti-Syphilitic Drugs. Narcosis Therapy. Dr. J. H. Quastel, Bio-chemical Laboratory, Cardiff City Mental Hospital, Whitechurch, Glamorgan, Wales.

During the year approximately 260 general conferences of the medical staff were held before which 986 patients were presented for consideration of discharge, visits, parole, etc. There were 110 admission conferences for dianostic purposes and recommendation of treatment, 899 cases having been presented. For the consideration of unusual

¹ The Psychiatric Quarterly, vol. 11, no. 2, April 1937.

cases or medical problems 17 clinical-pathological conferences were held.

The hospital continues in a crowded condition. It must have more beds not only to take care of the increased number of admissions, but to provide adequate facilities to replace the 530 beds of the semipermanent buildings in the Richardson group. During the fiscal year 1937 the total admissions were 1,099, the largest number admitted to the hospital since 1921, the post-war year, when 1,199 were admitted. As a matter of fact, the number admitted in 1937 was the largest of any year, except the 3 years, 1919, 1920, and 1921, comprising the period after the World War. The net increase during the year was 277, an increase in the daily average patients of 165. Thus the increased number of beds that it was necessary to provide between July 1, 1936, and June 30, 1937, was 277.

In 1926 when a survey was made in the hospital through a resolution of Congress, the Comptroller General estimated that to comfortably fill the various buildings beds could be provided for 3,600 patients. Since that time additional beds have been provided as follows:

	<i>Beds</i>
Medical and surgical building.....	200
Tuberculosis building no. 1.....	80
Continued treatment buildings nos. 1 and 2.....	320
Male receiving building.....	400
Female receiving building.....	300
Total.....	4, 900
Congress has authorized in the—	
Interior Department Appropriation Act for 1937 1 continued treatment building.....	180
Interior Department Appropriation Act for 1938 1 continued treatment building.....	180
Total.....	5, 260

At the present time the hospital has more than 5,700 patients, and the semipermanent group containing 530 patients should be replaced, making a total shortage of 970 beds. Additional buildings should be provided at an early date to relieve this overcrowded condition and to provide beds for the patients in the semipermanent group. The buildings in this group constitute a fire menace, the temperature in them in the hot summer weather is almost unbearable, and the cost of maintaining them in repair is increasing very rapidly.

MOVEMENT OF POPULATION

On June 30, 1937, 5,667 patients remained in the hospital as compared with 5,390 on June 30, 1936, an increase of 277.

The total number of patients under treatment during the year was 6,489, as compared with 6,240 for the preceding year, an increase of 249.

The total number of admissions during the year was 1,099, as compared with 925 the preceding year, an increase of 174.

The total number of discharges for the year was 490, as compared with 552 in the preceding year, a decrease of 62.

The total number of deaths for the year was 332, as compared with 298 for the preceding year, an increase of 34.

The total number of discharges and deaths, combined, was 822, compared with 850 for the preceding year, a decrease of 28.

There were 50 burials in the hospital cemetery, as compared with 69 the preceding year, a decrease of 19. With the cooperation of the War Department the bodies of 38 service men, honorably discharged, were buried in the Arlington National Cemetery. The other 244 bodies were buried by private undertakers, in cemeteries in Washington and elsewhere throughout the United States.

The daily average patient population was 5,537.6 as compared with 5,373 the preceding year, an increase of 164.6.

Movement of Patient Population, Fiscal year 1937

	Male			Female			Total
	White	Colored	Total	White	Colored	Total	
Remaining on rolls June 30, 1936.....	2,751	838	3,589	1,133	668	1,801	5,390
Admitted during year ended June 30, 1937.....	523	196	719	247	133	380	1,099
Total number under care and treatment during year ended June 30, 1937.....	3,274	1,034	4,308	1,380	801	2,181	6,489
Discharged as—							
Not insane.....	3	2	5	1	0	1	6
Recovered.....	82	23	105	39	21	60	165
Improved.....	90	25	115	30	9	39	154
Unimproved.....	105	27	132	25	8	33	165
Total discharged.....	280	77	357	95	38	133	490
Died.....	140	67	207	78	47	125	332
Total of patients discharged and died.....	420	144	564	173	85	258	822
Number of patients remaining on rolls June 30, 1937.....	2,854	890	3,744	1,207	716	1,923	5,667

Supplies.—The supplies produced on the hospital reservation, including farm and garden products such as tomatoes, beans, parsley, spinach, squash, corn, turnips, etc., included the following: 285,544 gallons of milk, 124,362 pounds of fresh pork, 11,966 dozen eggs, 5,809 pounds of chicken, 25,291 bunches of beets, 15,200 bunches of carrots, 42,655 ears of green corn, 7,475 bunches of endives, 7,600 pounds of grapes, 1,134 bushels of kale, 27,921 heads of lettuce, 18,628 bunches of green onions and 29 bushels of dry onions, 985 bushels of mustard and mustard greens, 262 bushels of parsnips, 603 bushels of pears, 75 bushels of green peas, 135 bushels of green peppers, 1,064 bushels of sweetpotatoes, 2,481 pumpkins, 9,370 bunches of radishes, 343 bushels

of rape, 280 bushels of spinach, 1,007 squash, 2,625 bushels of Swiss chard, 2,843 bushels of tomatoes, 793 bushels of turnips and 335 bushels of turnip greens, 604 bunches of asparagus, 266 bushels of apples, 207 bushels of lima beans, 259 bushels of string beans, 807 bushels of cabbage, 291 bushels of cabbage sprouts, 645 bushels of collards, 132 bushels of cucumbers, and various other items of the same class.

In addition to the items mentioned, there were made at the hospital 24,059 gallons of ice cream. The farm produced forage as follows: 37 tons of alfalfa hay, 32 tons of soybean hay, 20 tons of soybean and sudan grass hay, 44 tons of timothy hay, 80 tons of wheat hay, 996 tons of corn ensilage, and 2,600 bushels of ear corn.

The shoe shop produced 12,211 pairs of various kinds of shoes and slippers, and in addition 2,482 pairs of shoes and slippers were repaired; 73 dozen men's belts, 2,123 brushes, and 96 floor brooms were made in the same department. The broom shop produced 5,200 common brooms and 65 whisk brooms. There were made in the mattress shop 2,331 mattresses, 2,133 pillows, and one chair cushion. In the bakery there were turned out 956,664 loaves of bread, 63,464 pounds of pastry, and 3,313,392 rolls. The laundry washed, dried, mangled, and ironed 12,914,568 pieces. The power plant manufactured 531,700,000 pounds of steam; the electrical department generated 3,633,340 kilowatts of electricity; there were pumped 526,556,000 gallons of water, and the refrigeration plant produced 7,589 tons of ice and refrigeration. In fact, all the steam, electricity, ice, and refrigeration used on the reservation was manufactured by the hospital.

In addition, large quantities of clothing for men and women were made in the sewing rooms and tailor shops, and articles of clothes, bed linen, and tableware were produced by the occupational therapy department throughout the institution. The patients on the wards, under the direction of the occupational therapists, made all the dresses furnished the patients, hemmed all the sheets and blankets, assisted in making stand covers, table covers, tablecloths, towels, wove stand covers, rugs, towels and similar items, and manufactured many hundreds of small toys and recreation items, including checkerboards, chessboards, and cribbage boards.

Dairy and cow barn.—The Holstein-Friesian herd was again tested for tuberculosis in April and found to be free from this disease. The herd, consisting of 247 cows, 8 bulls, and 160 heifers, is one of the largest accredited herds in the country.

The herd has been free from Bang's (abortion disease) during this period. Herd blood tests were made in July, October, and March. All animals were negative to the agglutination test.

Personnel.—The total number of employees on the hospital rolls June 30, 1937 was 1,697. There were 452 appointments during the

year, and 525 separations; 50 of the appointments and 173 of the separations were of the emergency class on temporary rolls.

During the year 2 of the old employees were retired from the service on account of age, and 20 on account of disability.

Administrative promotions (salary rating increases) were granted to 540 employees. Promotions in grade and position were granted to 75 employees.

Construction.—Federal project no. 17, of the P. W. A., was completed. This consisted of installing new porches on Oaks, Dawes, Garfield, Allison-C and Allison-D buildings.

Federal project no. 16, of the P. W. A., for increasing the water supply, has still some work to be done—an additional well which the contractor is installing.

Water connection has been made to the lower farm for fire protection, and additional fire hydrants installed throughout the hospital grounds.

Continued Treatment Building No. 3.—Plans were drawn and specifications prepared for Continued Treatment Building No. 3. When the bids were received the lowest bid was found to be more than the amount appropriated. A deficiency estimate was prepared and transmitted through the Department of the Interior and the Bureau of the Budget to Congress, asking for an additional appropriation which has recently been authorized and a contract is now under way looking toward the construction of this building.

Supplies.—Supplies were ordered in the amount of \$1,162,000. In the purchasing of these items over 300 special contracts were drawn by the hospital for this purpose.

Radios.—The installation of radio sets with loud speakers has been extended; such speakers have been installed in the occupational therapy shops of the male receiving and female receiving buildings, serviced from the hospital sets in those buildings.

A hospital radio set with microphone connection for announcements for paging purposes was placed in service in the C—service supervisor's office. All wards in B, C, and M buildings are provided with speakers connected with this set, and it is hoped to continue such installations until practically the entire hospital has such outfits.

Fire protection.—Regular inspections were made of the whole hospital by the fire marshal for the purpose of protecting it from fire. During the year there have been 28 fire alarms, the property damage amounting to \$503.94.

Library.—Additional books have been added to the medical library during the year, bringing the total to 15,115 volumes. Fifty-nine current magazines, twenty of them foreign, are regularly received in this library. Some of the magazines are sent to the various departments and the rest kept on file in the medical library. In addition to the

books in the library, others were obtained from the Surgeon General's library and from the Library of Congress as required.

Three hundred books were added to the patients' library, making a total of 16,380. Approximately 200 books were drawn daily, two-thirds of them fiction. There are about 3,600 books in constant circulation.

Social service.—The social service report from July 1, 1936 to June 30, 1937, showed the following:

Number of out-patients on rolls July 1, 1936.....	85
Number of out-patients on rolls June 30, 1937.....	114
Average number on rolls per month.....	104
Number of patients discharged from the rolls.....	164
Number of out-patients under care during the year.....	258
Average carried during one month (in- and out-patients).....	212
New patients (out on visit).....	194

NEEDS OF THE HOSPITAL

An estimate of \$1,199,025 for the support, clothing, and treatment of the patients in Saint Elizabeths Hospital for the fiscal year ending June 30, 1939, is recommended. This is \$49,275 more than was appropriated for 1938, and based on an estimate of 1,825 Federal patients. On June 30, 1937, there were 1,776 such patients in the hospital. We have unofficially been advised that there will be about 50 patients sent to the institution from the Pacific coast by the Navy Department in the near future. The number estimated, in view of this information seems very conservative. There was an increase of 277 patients in the hospital on June 30, 1937, over the same date of the previous year, and it is conservatively estimated that the number to be provided for during the year 1939 will be 5,850. In addition to the 1,825, chargeable to the Federal Government and authorized under the Interior Appropriation Act, the number that will probably be cared for in the hospital during the next year are: 3,700 beneficiaries of the District of Columbia; 90 beneficiaries of the United States Veterans' Administration; 135 beneficiaries of the United States Public Health Service; 30 beneficiaries of the United States Soldiers' Home; and 70 beneficiaries of the Indian Bureau. The funds for the beneficiaries of the District of Columbia will be appropriated for in the District of Columbia Appropriation Act; for the beneficiaries of the United States Veterans' Administration in the appropriation for the United States Veterans' Administration; the beneficiaries of the United States Public Health Service will be carried in the appropriation of the United States Public Health Service; the beneficiaries of the United States Soldiers' Home to be paid for from United States Soldiers' Home funds; and beneficiaries of the Bureau of Indian Affairs to be paid for by transfer from funds appropriated for conservation of health among Indians.

The rate estimated for the care of the patients during 1939 is \$1.80 per capita per day, the same as for the past preceding 3 years, notwithstanding the fact that the cost of food and other supplies seems to be increasing, and new legislation pertaining to vacation and sick leave to employees has a tendency to increase the cost.

Included in the estimate is \$185,000 for repairs and improvements to buildings and grounds, the same amount that was included in the previous years. Out of this sum will come funds for keeping the various buildings in repair, including plumbing, heating, steamfitting, plastering, glazing, painting, etc., for the repair and widening of roads and walks, the maintenance of railroad tracks, etc.

The hospital continues to grow. The admissions seem to be increasing, and there is still a shortage of beds. One thousand two hundred and fifty additional beds should be provided to cover immediate needs and, as explained in the forepart of this report, including replacement of the semipermanent group, 530 beds would be required at once, and at the rate the population of the hospital is increasing by the time these beds could be provided even with 1,300 additional beds there would be few, if any, vacancies.

There is an estimate for 5 continued treatment buildings, each containing 180 beds, at a cost of \$1,500,000. Two of these buildings are to be located adjacent to the continued treatment kitchen, where provision has been made for the preparation and service of food. The other three buildings are to be located in outlying districts to the east of the continued treatment kitchen, and as the food is prepared it is to be sent from this kitchen to the dining rooms included in the new buildings.

There is an estimate for \$900,000 for 3 other continued treatment buildings, each containing 180 beds, to replace the semipermanent buildings erected in 1918 at a cost, including equipment, kitchen, and dining room, of \$200,000, with an estimated life of from 15 to 20 years. These buildings have been in use more than 18 years and show a material deterioration. The cost of maintenance is very high and is increasing each year. A good part of the appropriation for repairs and improvements is expended in keeping these buildings in use. These buildings are more or less of a fire menace and should be replaced at an early date.

To take care of the additional number of patients admitted and the increase in the vacations and sick leave allowed employees additional personnel is required. This will include various types but more particularly ward service employees.

There is an estimate of \$150,000 for a chapel, including preparation of plans and specifications, advertising, supervision of construction, and equipment. A chapel for the religious services for the patients at Saint Elizabeths Hospital was provided on the third floor of the

old center building in 1875. This chapel can accommodate about 500 patients. The hospital has over 5,600 patients, and is growing away from the site on which the old center building is located. It is considered advisable to erect such a chapel on the plot of ground on the east side of Nichols Avenue with a seating capacity of from 1,000 to 1,500, to be used by the various religious denominations having followers among the patients of the hospital. This chapel having its meeting place on the ground floor and located where noted will be not only more accessible to the patients, but many of the patients who are feeble or crippled will be in position to attend divine services who cannot attend under present conditions. Recommendations have been made by the various chaplains of the hospital for such an edifice.

There is an estimate of \$250,000 for one additional 750-horsepower boiler, air compressor, brine pumps, and necessary utilities. The hospital recently installed three 750-horsepower boilers, which were sufficient for its needs at that time. Space was left for an additional boiler that would be required when the new buildings were erected. The growth of the hospital, with the recommendation for additional buildings, will require additional boiler, air compressor, brine pumps, and utility equipment.

There is an estimate of \$750,000 to purchase farm land, to construct buildings to house patients who would work on farm, buildings to house employees, farm animals, dairy, piggery, poultry plant, plant for pasteurizing milk, making ice cream, and other necessary farm buildings, including expenditures for the purchase of land, preparation of plans and specifications, advertising, and supervision of construction.

The hospital consists of four plots of ground, in all about 800 acres. The last land purchased for hospital use was in 1891. At that time the hospital had about 1,500 patients, and over 600 acres were used for farm and garden purposes. Gradually new buildings have decreased the amount available for farm purposes. The hospital, while originally isolated some miles from the center of the city, at the present time on account of the growth of the city and the use of various forms of traffic, is now adjacent to the city and the center of a growing population. The dairy and piggery are in proximity to buildings occupied by patients. This is undesirable, if not objectionable.

One part of the farm is located about a half a mile from the main site, in what is known as Congress Heights. It has been recommended that a portion of this ground be turned over to the National Capital Park and Planning Commission for playgrounds for children; another part it is recommended be turned over to the District of Columbia for streets and roads. Parts of this same site have been taken by the city for widening streets.

Another plot of the hospital is about $4\frac{1}{2}$ miles from Washington; a part of it is on low land, sometimes under water.

It is believed desirable to get between 5,000 and 6,000 acres of land, and to concentrate on farm projects in one place, increase the size of the dairy herd, the piggery, and the poultry farm, and build about six cottages, housing 40 patients each on this site. Through this arrangement an increased number of patients would derive the therapeutic benefits of healthful outdoor occupation. This would also result in an improved economic arrangement in that the hospital would be able to secure sufficient milk for all purposes, increase the quantity of pork products, and cure pork products, thus reducing the quantity of ham, bacon, and shoulder to be purchased, and increasing the quantity of poultry products, such as fowl and eggs.

While it is stated the additional expense required for the physical upkeep and operating would be about \$25,000, less \$5,000, the income from the enlarged farm, dairy, piggery, etc., would more than offset this, resulting in a net credit to the benefit of the Government.

Five hundred thousand dollars has been estimated for a building for storeroom, warehouse, laundry, and industrial shops, including preparation of plans and specifications, advertising, supervision of construction, and equipment.

During the past 25 years various changes have taken place in the hospital—the population practically doubled; about 10 or 15 new buildings added—but no change has been made in the storeroom and warehouse. The present storeroom, with cold storage equipment, is practically out of date and the storage facilities are insufficient to care for adequate quantities of current supplies. In order to house supplies that must be cared for and regularly issued to the various buildings, all sorts of out-of-the-way places have been utilized. The basements of many buildings housing patients have been used for storing furniture. It is difficult to give proper protection to articles in all classes of buildings, and there is possibility of shrinkage.

Saint Elizabeths Hospital has a shoe-manufacturing department, with 1 employee and about 60 patients, making all of the shoes used in the institution. A converted room under detached dining room is used for that purpose. This department is growing; it not only makes and repairs shoes, but makes belts, suspenders, and mats. A proper place with sanitary working conditions should be provided, and it is contemplated to have space available in a new store and warehouse building when authorized.

When the present laundry building was erected, the total amount of material washed and laundered each year was about 3,000,000 pieces. This has increased until at the present time there are over 12,000,000 pieces washed and laundered each year. It has outgrown the original building; small additions have been put on each side, but it is necessary to furnish more room. It is contemplated, if a new building is au-

thorized, to make space at one end of the first floor of this building for the laundry.

The manner of feeding the patients has vastly changed during the past few years. At the present time the more modern method of feeding by the cafeteria system is in use. This permits an election of the food by the patients and insures the service of hot food. No space is available near the older buildings that may be used to furnish adequate cafeteria service. It is contemplated to make one end of the ground floor of the new building for store and warehouse purposes available for such use.

REVISION OF LAWS FOR THE ADMISSION OF PATIENTS

A bill has been introduced in Congress, upon the recommendation of the District Commissioners, to change the method of admissions to Saint Elizabeths Hospital. The hospital cooperated with representatives of the District upon the form of the proposed bill.

PUBLICATIONS

White, William A., superintendent:

The Dependence of Modern Civilization upon Health. *Medical Annals of the District of Columbia*, vol. V, no. 7, July, 1936. Pp. 189-198.

Post Graduate Work in Psychiatric Nursing (symposium with Dr. Meyer, Dr. Strecker, Dr. Terhune, and Dr. Menninger). *American Journal of Nursing*, February, 1937. P. 185.

Introduction to "The Mentally Ill in America" by Albert Deutsch. Doubleday, Doran and Co., 1937.

Education in the Present World Crisis. *The Educational Record*, April, 1937. Pp. 235-241.

Eldridge, Watson W., principal medical officer:

Cleido cranial Dysostosis. *American Journal of Roentgenology*, vol. 34, July, 1935. Pp. 41-49. (With Simon, A., and Ramos, R.)

Karpman, Benjamin, senior medical officer:

The Psychology of Chess. *Psychoanalytic Review*, vol. 14, no. 1, January, 1937. Pp. 54-69.

Simon, A., assistant medical officer:

(With Eldridge, Watson W., and Ramos, R.) Cleido cranial Dysostosis. *American Journal of Roentgenology*, vol. 34, July, 1935. Pp. 41-49.

Baker, William Y., junior medical officer:

Alcohol Injection of Lumbar Sympathetic Ganglia in Arteriosclerosis of the Extremities. *Medicals Annals of the District of Columbia*, vol. 6, no. 1, January, 1937. Pp. 9-14.

Ramos, R., junior medical officer:

(With Eldridge, Watson W., and Simon, A.) Cleido cranial Dysostosis. *American Journal of Roentgenology*, vol. 34, July, 1935. Pp. 41-49.

Richmond, Winifred V., psychologist:

Personality: Its Development and Hygiene (book). Farrar and Rinehart, 1937.

The Exceptional Child and the Family Constellation. *Bulletin Wood's School*, 1937.

Characteristics of Adolescence. *Proceedings of the North Atlantic Conference of Home Economics Teachers*, April, 1937.

HOWARD UNIVERSITY

Mordecai W. Johnson, *President*

Seventy years of service.—During the school year 1866–67, with meager resources, a handful of students, and surrounded by an atmosphere of unfaith in the Negro's capacity for educational advancement, Howard University was launched with the purpose of providing able teachers and professional leaders for a distressed and scattered people. Today, after 70 years of service, the institution is a well-established university with 2,108 students enrolled in 9 undergraduate, graduate, and professional schools and colleges, with a plant and other assets valued at a sum in excess of \$8,000,000, with 10,008 graduates at work in 43 States and 24 foreign countries, and with a faculty which now includes the largest community of Negro scholars in the world, who, in their accomplishments, represent victory over every obstacle toward cultural development which 70 years ago seemed insuperable.

As the founders desired, the majority of Howard University's 10,008 graduates have served as teachers, devoting their lives to the training of the youth and to the building of a system of education in the South. Six hundred others have become leaders in religion, while 1,777 others have become physicians and surgeons (approximately 48 percent of all Negro physicians and surgeons now practicing); 828 others have become dentists (approximately 48 percent of all Negro dentists now practicing); 1,195 have become lawyers (approximately 96 percent of all lawyers now practicing); 518 have become pharmacists; 136 have followed engineering and architecture and other applied science; while 148 have gone into commerce and finance. In every Negro population center of the United States these graduates are at work, and they have had a major share in the remarkable development of the Negro.

"Here is a record," said President Franklin D. Roosevelt, "of which the Negro race may be proud. It is a record of which America is proud."

Sixth year of the 20-year program.—The year 1936-37 was the sixth year of development of the 20-year program approved by the Government. It was a year of outstanding progress in the matter of new buildings and equipment and of measurable progress in the matter of the number and quality of students, the number and quality and work of the faculties, in financial receipts and management, and especially in favorable factors related to the developing graduate school.

President Roosevelt dedicates chemistry building.—The most significant event during the year was the visit of the President of the United States in October to dedicate the new chemistry building just finished by the Public Works Administration and formally turned over to the university on the day of his visit by the Secretary of the Interior. This building provides facilities for first-class work, comparable to the best available in the United States. The Public Works Administration also completed the erection of the heat, light, and power plant at a cost of \$550,000. The President of the United States made an additional appropriation of \$305,000 of Public Works funds so as to enable the university to begin construction on the new library building under a contract costing \$1,105,000. He also made available to the university \$525,000 of Public Works Administration funds for the construction of a long-needed new dormitory for men. Concerning these Public Works projects President Roosevelt said, "Howard University has shared as of right in our Public Works program. These Government-financed improvements in the facilities of this great center of Negro education should enable it to continue to provide for its students cultural opportunities comparable to those offered by other first-class institutions of higher learning in the country."

Advancing numbers and quality of students.—During the year 1936-37 Howard University experienced an increase of 138 in its enrollment, representing a total increase of 478 students since 1933-34, when the number of students reached the bottom of the depression trough. In all schools and colleges of the university a marked increase in the preparation of entering students was observed. Of the 111 new entrants in professional schools of the university 76, or approximately 68 percent, were equipped with 4 years or more of previous college and graduate training. The enrollment of the school of religion was entirely of graduate caliber and 190 or 72.1 percent of the students in the 4 professional schools of medicine, dentistry, law, and religion were degree-holding students. Of the 2,108 students in the entire institution 491 or 23.3 percent were persons holding 1 or more advanced degrees.

Graduate school goes forward.—The rapid development of high-school enrollment throughout the States of the Negro's majority residence, accompanied by the accrediting of high schools and colleges by the Southern Association of Secondary Schools and Colleges, was

making an increasing demand for teachers with graduate training of high caliber. There was widespread recognition by leaders in State education of the danger of establishing such graduate work hastily as a part of the program of the young State colleges just now beginning to secure accreditation as colleges, and of the necessity of providing one or more highly developed centers of graduate work in the area with departments well-manned by an adequate number of mature teachers and with related departments having equipment and resources for advanced work. Howard University stood out as the most promising center for such graduate instruction in the entire field. Two hundred and eighty-four students from 55 leading colleges and universities enrolled for graduate work during the year, 91 percent coming from institutions for Negro youth and 87.1 percent coming from the States of the South, the places of greatest educational need. This represented an increase of 42 in the number of graduate students and an increase of 27 in the number of institutions sending students for graduate work. Special new facilities were provided for graduate study in chemistry, including research rooms and research equipment in the new chemistry building; and the prospect of special rooms for graduate study, graduate seminars, and individual cubicles in the stacks of the new library building was inspiring.

Howard University graduates receive distinguished appointments.—The prestige of Howard University and the competence of her work were signalized by the confirmation and appointment of two of her graduates to the presidency of two of the leading institutions for the education of Negro youth; two of her medical graduates to be chief of staff in two of the leading hospitals for Negroes in the United States, one under Government auspices and one under private auspices; the appointment of one of her graduates to be Special Assistant to the Attorney General of the United States; of another to the judiciary in the State of New York; and the nomination of a dental graduate for the governing council of a great American city by a nonpartisan body of citizens of distinguished standing.

Forward steps in clinical medicine.—The department of surgery was reorganized under a full-time professor provided by a grant from the Rockefeller Foundation and the General Education Board. Under the same grant a new head for the department of medicine was appointed. Continued help was received from the General Education Board and the Rockefeller Foundation in the training of teachers for the preclinical and clinical sciences. The clinical teaching of tuberculosis was introduced. The city maternal and infant-welfare clinics were combined with those operated by the Howard University staff at Freedmen's Hospital, to provide a service of greatly increased efficiency.

Faculty growth in full-time members and in strength.—Judicious changes in the staff of the university brought about the transformation

of positions held by 27 part-time teachers into 11 full-time teaching positions and brought 4 net additions to the teaching staff of the university. The full-time staff now constitutes 57.1 percent of the persons employed and does 87.8 percent of the educational work. Significant research was being undertaken in 10 departments of instruction. Eight books and 110 scholarly articles were published during the year. The *Journal of Negro Education* had advanced to a circulation of approximately 600, had achieved recognition as the outstanding current publication in the field of Negro education and one of the best edited educational periodicals in the United States. Many members of the faculty were awarded fellowships and other financial encouragement by distinguished organizations and fully 10 percent of the full-time members of the staff were away on leaves of absence for further study in America and in Europe. Members of the faculty were increasingly represented on the programs of scientific and other scholarly societies, and four were chosen as representatives in world undertakings of a scholarly nature in the field of education, social science, and religion.

Increased income and balanced budget.—The current income of the university was increased by \$91,000 over the income for the previous year. The budget was kept in balance and a surplus was made available for the retirement of the current deficit. The university continued to receive the support of educational foundations, grants and allowances being made during the year by the Rockefeller Foundation and the General Education Board, the Julius Rosenwald Fund, the Carnegie Corporation, the Emergency Committee in Aid of Displaced German Scholars, and the Oberlaender Trust. The university was thrilled to receive a \$52,000 increase in its endowment, for traveling scholarships for promising youth, through the settlement of the estate of Lucy Moten, a colored school teacher of the city of Washington.

Outstanding needs.—The outstanding needs of the university, made increasingly clear by the work of the year were (1) an increase of 32 in the number of mature teachers of professorial rank, (2) an increase of \$148,000 in the annual sum of money available for teachers' salaries, (3) a sum of \$300,000 to double the gravely deficient book collection in our libraries, (4) the doubling of funds for scholarship and student aid, especially for teachers in service in the South, who receive low salaries and may not otherwise find it possible to pursue the graduate work which they need to increase their efficiency, and (5) funds for at least that minimum of research which is necessary to maintain a living mind in the members of the teaching staff.

STUDENTS

Enrollment for the year 1936-37.—The total enrollment of Howard University (see table following) for the year 1936-37 was 2,108, of whom 1,108, were men and 1,000 were women, as compared with

the total of 1,970 for 1935-36, of whom 1,072 were men and 898 were women. A net gain of 138 students, or 7 percent, is shown, as compared with a net gain of 63 students, or 3.3 percent in 1935-36. This enrollment represents a gross gain of 482 students since the low point of the depression in 1933-34.

Geographical distribution.—Of the regular students enrolled for the school year 1936-37, 95.8 percent came from the continental United States and 4.2 percent from without the borders of the United States, as compared with 95.2 and 4.8 percent, respectively, during 1934-35. The percentage of students coming from the District of Columbia was 27, as compared with 28.7 percent during 1935-36.

Forty States sent 1,871 candidates for degrees in 1936-37, as compared with 41 States sending 1,717 candidates for degrees in 1935-36. Divisional distribution of candidates for degrees is as follows: *From the North*, 470 students, as follows: New England, 55, the Middle Atlantic States, 272; the East North Central States, 94; the West North Central States, 49. *From the South*, 1,394 students, as follows: From the South Atlantic States, 1,177; from the East South Central States, 102. *From the West*, 7 students, as follows: Mountain States, 2; Pacific States, 5.

Summary of Students Enrolled in Howard University for the Years 1936-37 and 1935-36

Divisions of the university	Net enrollments							
	1936-37			1935-36			Total gain	Total loss
	Total	Men	Women	Total	Men	Women		
THE COLLEGES								
College of liberal arts.....	1,244	593	651	1,174	548	626	70	
School of engineering and architecture.....	52	52		52	52			
School of music.....	75	28	47	55	20	35	20	
Graduate school.....	284	110	174	236	134	102	48	
Total.....	1,655	783	872	1,517	754	763	138	
PROFESSIONAL SCHOOLS								
Theological college.....	(1)	(1)	(1)	8	7	1		8
Graduate school of theology.....	21	21		19	18	1	2	
School of law.....	70	68	2	62	56	6	8	
School of medicine:								
College of medicine.....	139	133	6	142	135	7		3
College of dentistry.....	38	38		38	37	1		
College of pharmacy.....	31	26	5	26	21	5	5	
Total.....	299	286	13	295	274	21	4	
Total in regular courses.....	1,951	1,069	885	1,812	1,028	784	142	
Special students in music, religion, law, dentistry.....	162	44	118	158	44	114	4	
Total.....	2,116	1,113	1,003	1,970	1,072	898	146	
Less duplications.....	8	5	3				8	
Grand total (net).....	2,108	1,108	1,000	1,970	1,072	898	138	

¹ Discontinued.

Students of graduate caliber.—Seventy-six, or approximately 68 percent of the 111 students entering the freshmen classes of the professional schools for the first time during the school year 1936-37, were equipped with 4 years or more of previous college training. One hundred ninety or 72.1 percent of the students in the four professional schools of medicine, dentistry, law, and religion were degree-holding students. Of the 2,108 students in the entire institution, 491 or 23.3 percent were persons holding 1 or more advanced degrees.

Scholarship and student aid.—Scholarships within the university continued to be administered on the basic allotment of 7½ percent of all student fees, as provided by the trustees of the university. Work opportunities increased over last year, and the majority of our students availed themselves of the installment system of payment of fees.

In the undergraduate colleges 294 or 21.5 percent of the students received aid in some form, including 131 National Youth Administration work awards. Of a total enrollment of 284 in the graduate school, an average of 84 per semester received some form of aid. The major portion of this aid came from 55 National Youth Administration awards. Thirty students in the professional schools also received National Youth Administration awards. The university received a gift of \$52,000 from the estate of Lucy Moton, a colored school teacher of Washington, to provide traveling fellowships for worthy students.

The aid of the National Youth Administration has been a decisive blessing. Even with its help we could give assistance to only 23 percent of all applicants. The scholarship resources of the university could be doubled without fully meeting our urgent needs.

GRADUATES

Number and distribution.—The total number of 226 students graduated in 1936-37 (see table below) represents a decrease of 18 graduates as compared with 244 graduates in 1935-36. There were 127 male graduates and 99 women graduates, as compared with 115 and 129, respectively, for the year 1935-36. The graduating classes of 1936-37 entered the university (in greater part) in 1933-34 when enrollment had reached its lowest point on account of the depression. Since that year enrollment has steadily risen and subsequent graduating classes are expected to show a corresponding increase.

Honorary degrees.—Three honorary degrees were conferred at commencement in June 1937. Franz Boas, anthropologist of Columbia University, New York; John M. Gandy, president of the Virginia State College, Petersburg, Va.; and David D. Jones, president of Bennett College, Greensboro, N. C., were awarded the degree of doctor of laws.

Total number of Howard graduates.—The total number of graduates of Howard University is now 10,008. Of this number the registrar

has over 6,000 correct addresses in 43 States, the District of Columbia, and 15 foreign countries, classified alphabetically by States, cities, sex, schools, and classes. The registrar of the university has made a special study of the economic status of these graduates, giving major attention to the classes of 1928 through 1935.

Summary of Students Graduated by Howard University for the Years 1936-37 and 1935-36

Divisions of the university	Graduates					
	1936-37			1935-36		
	Men	Women	Total	Men	Women	Total
THE COLLEGES						
College of liberal arts.....	44	64	108	38	94	132
School of engineering and architecture.....	1	—	1	6	—	6
School of music.....	1	2	3	2	1	3
Graduate school.....	12	24	36	20	25	45
Total.....	58	90	148	66	120	186
PROFESSIONAL SCHOOLS						
School of religion.....	7	—	7	6	1	7
School of law.....	15	2	17	4	—	4
School of medicine:						
College of medicine.....	34	1	35	33	2	35
College of dentistry:						
4-year course.....	11	—	11	5	—	5
Dental hygiene.....	—	5	5	—	6	6
College of pharmacy.....	2	1	3	1	1	2
Total.....	69	9	78	49	10	59

TEACHING STAFF

Number and distribution of teachers.—There were 248 members of the teaching staff during the school year 1936-37, of whom 144 were on full time and 104 were on part time, representing a full-time equivalent of 164 teachers. This represents a gain of 11 full-time teachers and a loss of 27 part-time teachers—a net full-time equivalent gain of 4 teachers.

Number of teachers in relation to the 10-year program.—In the 10-year program for Howard University agreed upon by the Government, definite objectives were determined in regard to the ratio of students to teachers in each division of the university. The status of our progress in relation to these objectives continues to be favorable, but it is not fully satisfactory and is in imminent danger of being thrown far out of balance by increasing enrollment, if concurrent increases in staff are not made. When the depression caused the enrollment of the university to drop, from 1931-32 to 1933-34 the university reduced its staff by 44 members, 30 of whom were full-time teachers and 14 of whom were on part time, together making the equivalent of 34.5 full-time persons. In the 3 years since 1933-34

enrollment has increased by 482 students, from 1,626 to 2,108, with commensurate increase in the teaching load. During this 3-year period, however, the university has been able to make only 10 new full-time additions to the staff. The consequence is that while the teaching staff in the college of liberal arts is adequate for the undergraduate load, in most departments, it is pressed to the limit of its resources with the added graduate load of 284. Ten teachers are now bearing loads of from 16 to 19 hours and there are 75 classes above 30 in numbers. This college will be urgently in need of additions in 1938-39.

In engineering and architecture the ratio of teachers to students is favorable, but the nature of the subject matter is such that five teachers are bearing loads of from 16 to 19 hours. In music the ratio is favorable, but an additional teacher specializing in the history and appreciation of music is required to meet the needs of the undergraduate college students.

The faculty of medicine has made great progress in providing able teachers for its preclinical branches and needs only to fill a few gaps. But in all the clinical branches it is in urgent need of additional teachers, particularly now in general medicine, obstetrics, pediatrics, venereal diseases, psychiatry, and tuberculosis. The grant of \$100,000 made available by the General Education Board and the Rockefeller Foundation for the development of the departments of medicine and surgery has already made possible considerable improvement in the organization of the department of surgery and in the conduct of surgical service under the new full-time professor and head of the department. The selection and training of additional personnel in this department is very necessary. The professor and head of the department of medicine has just been chosen and careful organization of this department is now in progress.

In the faculty of dentistry one teacher is needed. The school of law is now functioning on a minimum full-time teaching staff and is in need of another full-time member.

Full-time teachers.—Progress continues to be made in the problem of overcoming the preponderance of part-time teachers whose teaching is supplementary to their vocations. The full-time equivalent increase in our teaching staff for 1936-37 is only 4 persons; it is encouraging to note, however, that our full-time staff has increased by 11 persons over the year before, while the part-time personnel has decreased by 27 persons.

Maturity of the staff.—Of the 164 (full-time equivalent) teachers on the staff this year, 34, or 21 percent were professors; 23, or 14 percent were associate professors; 35, or 21.3 percent were assistant professors; 72, or 43.7 percent were in the rank of instructor or below. According to the 10-year program of development our present staff should have

the following distribution: 66 professors, 16 associate professors, 33 assistant professors, 49 instructors.

The full professorial staff is seriously undermanned. The disparity in maturity, however, is not as great as the figures would show. Several mature and very able teachers are in the associate professorial rank, awaiting advancement which has been long delayed for lack of adequate funds. The increased appropriation for salaries voted by the Congress for 1937-38 will enable the university to take a substantial step forward in improving this situation.

The teachers continue with eagerness their efforts after improved efficiency through further study. Seventeen members of the staff were on leave of absence for further study during the year just ended, representing 10 percent of the entire faculty.

Salaries of teachers.—In the 10-year program of development for Howard University the minimum, average, and maximum salary scale for teaching personnel was definitely fixed. The salary scale for Howard University as at June 30, 1937, was as follows: The median instructional salary had reached \$1,800; no teacher was receiving less than the minimum instructional salary of \$1,600; the average salary in the instructional rank had reached \$1,869, which is \$231 below the average of \$2,100 agreed upon in the 10-year program. In the assistant professorial rank no teacher was receiving less than the minimum of \$2,300 agreed upon; the median salary in this rank was \$2,500, while the average salary in the assistant professorial rank had reached \$2,650, which is \$150 below the agreed upon average of \$2,800. In the associate professorial rank the median salary was \$3,500. No teacher was receiving less than the minimum of \$3,000, while the average salary had reached \$3,490 or \$10 less than the average of \$3,500 agreed upon. In the rank of full-time professor there were 10 teachers receiving less than the minimum of \$4,000 agreed upon; the median salary was \$4,000; and the average salary in the professorial rank had reached \$4,491, which is \$809 short of the agreed upon average of \$5,000.

Here we place our finger upon the strategic center of further improvement. All able men in the field of education are agreed that competent instruction depends primarily upon an adequate number of mature and able teachers with salaries adequate to assure their full-time attention to their work. Howard University needs (1) to advance the salaries of men in its professorial rank; (2) to bring into that rank, by advancement, the worthy teachers who are prepared to do its work; and (3) to supplement the number of such worthy teachers by an adequate selection of additions from the ablest men available. This work is in the nature of the case, slow of accomplishment, but it should go forward steadily year by year, because every other improvement depends for its full significance upon this decisive step.

THE GRADUATE SCHOOL

General trends.—During the current year the graduate school continued the general trend of increased enrollment which has prevailed throughout the last 10 years. There was also an increase in the number of students giving their full time to graduate study. The base of support was also widened by a substantial increase in the number of institutions sending students to the graduate school. While these institutions represented all sections of the country and included many of the best established colleges and universities in the United States, 91 percent of the enrollment came from institutions for Negro youth and 81.7 percent of the entire enrollment came from the States of the South.

Emergency aid funds contributed by the National Youth Administration constituted a decisively constructive stimulus both to the number of enrollment and the number of students able to give their full time to their studies. New and first-class facilities for graduate work in chemistry were provided in the special rooms for graduate study and research and the adequate equipment available therefor in the new chemistry building, and the prospect of special graduate reading rooms, seminar rooms, and cubicles for individual study in the stacks of the new library building was inspiring.

Enrollment.—The total enrollment of graduate students for the year 1936-37 was 284, as compared with 242 for the year 1935-36. This represents a net increase of 42 students for the year and an increase of 241 students over the enrollment of 1926-27. These students came from 58 colleges and universities, including some of the most distinguished American institutions. Thirty-six institutions for Negro youth, however, sent 258 students or 91 percent of the entire enrollment.

Departments of instruction.—The 284 graduate students for the school year 1936-37 did their work in 17 departments of instruction. One hundred fourteen or 40 percent of the students did their work in education, psychology, and philosophy; 74 or 26.1 percent did their work in the social sciences of economics, sociology, social work, history, and political science; 50 or 17.6 percent did their work in the natural sciences and mathematics, including bacteriology, botany, zoology, chemistry, and physics; and 46 or 16.2 percent did their work in English, German, and the romance languages and literatures.

Scholarship and student aid.—The university had the following scholarships available for the graduate school during the current year: Tuition scholarships voted by the board of trustees, \$3,300; tuition and room for especially able students, \$3,000, National Youth Administration, \$22,151; other work, \$150; LaVerne Noyes, \$115. Total amount available for scholarships, \$28,716. With this amount the university was able to help 82 students in the first semester and

87 students in the second semester. The amount of aid given was somewhat more than twice the amount available last year. The margin of unhelped need was still very great. By far the larger number of Negro public-school teachers in the South receive salaries under \$500 per year. If these teachers are to do the serious graduate study which is needed to insure the sound development of the public school system they must receive substantial scholarship and fellowship aid.

Degrees conferred.—Thirty-six degrees were conferred on 12 men and 24 women. Twenty-three were masters of science and 13 were masters of arts.

The future of graduate work.—The rapid development and accreditation of public high schools and colleges for Negroes in the States of their majority residence within the last 10 years has created an acute and growing need for mature teachers with thoroughly competent training on the graduate level. The soundness of the educational structure throughout these States depends primarily upon the caliber of graduate instruction which is made available to meet this situation.

Howard University is the most promising center for such graduate work in the entire area. The rapid increase in the enrollment in the graduate school from 43 in 1926-27 to 284 in 1936-37 is an index both of the rapidity with which the need has developed and of the remarkable opportunity which now confronts Howard University in this field. The fact that during the current year able graduates from 58 institutions came to Howard University for graduate instruction is an indication of the faith and hope which centers here. It is of the utmost importance to the States of the Negro's majority residence and to the people of the Nation that all possible steps now be taken to place the graduate work at Howard University on a sound and thoroughly competent basis and to enable the university to select and to train on the graduate level young men and women of unusual promise. In such a program certain immediate steps are urgent: (1) The book collection of the university should be doubled within a period of 5 years; (2) special scholarship and fellowship funds for graduate students should be provided; (3) funds should be available for at least that minimum of research which is necessary to maintain a living mind in the members of the staff who teach graduate students; (4) salaries of the mature teachers on the staff of the university should be so increased as to enable them to give their entire time to their work without worry; and (5) the number of such mature, well-paid teachers should be immediately increased.

THE COLLEGE OF LIBERAL ARTS

The new plan.—With trustee approval the new plan of study prepared by the faculty of the college of liberal arts becomes effective in September 1937, for all entering freshmen. This plan provides for the official establishment of a system of majors; a larger prescription of work for freshmen and sophomores; a reduction from 7 to 2 in the number of degrees offered by the college; greater emphasis upon social science and natural science and less upon foreign languages and mathematics; and the introduction of certain compulsory courses looking toward the physical and cultural welfare of the student.

Freshman orientation.—For 2 years an experiment in orientation and guidance has been under way to determine the most pressing needs of Howard college freshmen. A program of work in this field was developed and then applied to half of the freshmen. At intervals both halves were examined in personality growth, in reading, in study habits, and in general achievement, while the first half was examined in the course content only. The superiority of the first half over the second half, the division having originally been made along parallel lines, was so marked as to establish the value of the course, which it is hoped can next year be given to all freshmen.

Students.—The student registration during the year 1936-37 was 1,244, of whom 593 were men and 651 women. This is an increase of 70 over 1935-36.

Student activities.—The Howard players gave eight dramatic presentations during the year. At the intercollegiate tournament held at Hampton Institute, April 2, 1937, they won first prize. The debating society participated in six intercollegiate debates, all of which were nondecision events. The usual intramural and intercollegiate athletic games were carried on in football, basketball, track and field, tennis, swimming, rifle, boxing, wrestling, hockey, archery, and dancing. Howard college students published *The Hill Top* and *The Stylus*. They were active in intercollegiate student affairs of a national character.

Graduates.—During the year, 108 degrees were conferred as follows: A. B., 29; S. B., 19; S. B., in commerce, 4; A. B., in education, 36; S. B., in education, 10; S. B., in home economics, 7; S. B., in art, 3.

Faculty.—There were 84 active members of the faculty of the college of liberal arts during the academic year 1936-37. Of these, 22 were professors, 12 associate professors, 18 assistant professors, 25 instructors, and 7 assistants. There were 8 appointments. Ten teachers were on leave of absence for further study, and 10 others have been granted similar leave for the coming year. Faculty publications during the year 1936-37 included 6 books, 58 articles in scholarly periodicals, and 28 book reviews.

Needs.—Among the more urgent needs of the college of liberal arts are additional teachers in romance languages, commerce, political science and education, a structure for a little theater, a suite of rooms to serve as studios for the department of art, the completion of the remodeling of Thirkield Hall in harmony with already existing plans, certain very necessary repairs and improvements in the gymnasium on both the men's and women's sides, and approximately \$4,000 annually for the purchase of equipment and supplies for technical purposes in the departments for which such provision is not now being made.

MILITARY SCIENCE AND TACTICS

Official appraisal.—At the annual exhibition and review held on June 1, 1937, the student cadets displayed great zest and precision. Col. Richard Wetherill and Maj. Emil W. Leard, in charge of R. O. T. C. units in this area, declared that the Howard University unit was one of the best, and they were unreserved in their praise.

Enrollment.—The enrollment in military science and tactics during the year 1936–37 was 215 in the first semester and 312 in the second semester—an average of 263. This enrollment was distributed as follows: First semester, basic students 196, advanced students 19; second semester, basic students 259, advanced students 53.

Commissions awarded.—Sixteen students were awarded commissions as second lieutenants in the United States Army.

THE SCHOOL OF ENGINEERING AND ARCHITECTURE

Enrollment.—During the school year 1936–37 the school of engineering and architecture provided instruction for 69 students, 52 of whom were preparing for entrance into the professions of civil engineering, electrical engineering, and architecture. These students came from 18 States and the Virgin Islands. An increasing number came with from 2 to 4 years of previous college preparation.

Graduates and their employment.—One student received the degree of B. S. in electrical engineering, magna cum laude, June 1937. This graduate immediately found work in the field of his choice. Last year there were six graduates, and the senior classes for next year will enroll eight. The university now has 65 graduates in the engineering and architectural fields, distributed as follows: Architecture 12; civil engineering 3; electrical engineering 26; mechanical engineering 24. All of these graduates are employed. Several government departments are providing employment for Negro technical graduates. Outstanding among them are the Housing Division, Public Works Administration, United States Department of the Interior, the Civilian Conservation Corps and the Resettlement Division, United States Department of Agriculture.

Faculty.—The active faculty of eight full-time members include one associate professor, two assistant professors and five instructors. One associate professor and one assistant professor were on leave of absence. All staff members are experienced engineers or architects; 50 percent hold professional registration, distributed among the following States: North Carolina, Ohio, Pennsylvania, and Virginia. Eighty percent hold graduate degrees in engineering or architecture; one member holds the degree of doctor of philosophy.

Five lectures were presented to the student body by visiting engineers and architects during the year.

Needs.—Much of the present equipment, now obsolete, needs to be replaced. Laboratory and drafting room space equivalent to approximately 6,000 square feet are needed for a new electronics laboratory, an extension to the materials testing and mechanical laboratories, and to provide for two special small instrument rooms. The dean also states that two additional engineering and one architectural instructor are needed.

THE SCHOOL OF MUSIC

Outstanding features of the work during the year.—Enrollment was increased by 26 students. There was great improvement in the caliber of students. The concert series designed to furnish inspiring musical entertainment for students, faculty, and the citizens of Washington, continued to be a success. The Carnegie Corporation of New York provided the university with a valuable set of phonographic records, an excellent phonograph, and musical literature for the teaching of music in the college. This set has proved a great asset to the school of music by providing on the campus facilities for study and research in the history of music, public school music, orchestra, and conducting.

Number and distribution of students.—The school enrolled 223 students during the year, as compared with 197 during the previous year, representing an increase of 26 students or 11.3 percent. Seventy five of these students were registered in the regular degree courses in piano, organ, voice, violin, and public school music, while 148 were registered in the junior department.

Faculty.—There were 13 members of the faculty of music during the year. Ten of these gave full time to the work while three others gave time equivalent to one and one-half full time teachers. Two of these teachers were professors, three were assistant professors, six were instructors, and two were assistants.

One major appointment was made during the year in the department of piano. Six members of the faculty appeared in 19 recitals in 10 States. One appeared in recital at the White House.

Graduates.—Three students were graduated at commencement time. Two of these received the degree of bachelor of school music and one the degree of bachelor of music.

Musical organizations.—The university choir, the university glee club, the women's glee club, and the university orchestra have all been active during the year and have had many favorable public appearances. The university glee club appeared with the head of the department of public school music in recital at the White House. The department of violin has organized a new string quartette composed of advanced students in the department, for the purpose of playing chamber music. During the year this string quartette read the works of Haydn, Mozart, and Beethoven, and performed some of the works of Haydn and Mozart.

Needs.—This school needs a teacher of history and appreciation of music for service primarily to undergraduate students in the college of liberal arts. It needs also 15 upright and 4 grand pianos to replace worn-out instruments which have been in use for over 20 years.

SCHOOL OF MEDICINE

The school of medicine is the functional organization which represents the cooperative interests of the entire medical unit of the university without superseding the direct authority from the independent faculties to the board of trustees. The autonomous member units are the college of medicine, the college of dentistry, and the college of pharmacy. Freedmen's Hospital, an independent institution built upon grounds owned by the university, is functionally a part of the university medical unit.

COLLEGE OF MEDICINE

Outstanding events of the year.—(1) The progress made in reorganization of the surgical service in Freedmen's Hospital and the improvement in teaching of surgery under direction of the full time professor and head of the department; (2) appointment of a full time professor and head of the department of medicine effective July 1, 1937; (3) introduction of clinical teaching of tuberculosis made possible through cooperation of the District of Columbia Tuberculosis Association and Health Department; (4) grant of \$300 by the National Tuberculosis Association which made possible publication of six issues of the College Health Review by the department of bacteriology, preventive medicine and public health, for the purpose of stimulating interest nationally in the health of Negro college students, with special reference to prevention and control of tuberculosis; (5) combination of the city maternal and infant welfare clinics at Freedmen's Hospital with those operated at the hospital by the Howard University staff with a view

toward improvement of service to the public and of providing better teaching facilities for medical students; and the provision of a full-time assistant in obstetrics-gynecology to supervise home deliveries; (6) provision for supervision of home deliveries by students in placing this work in charge of a full-time assistant of obstetrics, under the control of the head of the department of obstetrics-gynecology.

The addition of two residents; one each in medicine and surgery, has proved to be an important step forward. The hospital has requested a reduction of internes from 24 to 18, the other six places to be filled by assistant residents. This, if granted by the Department of the Interior, will provide the resident staff with a greater number of more experienced men and, at the same time, will improve the value of the internship as a fifth year of medical education.

Students.—Of a total of 250 applicants, 220 satisfied minimum requirements for admission. Forty-three freshmen students were admitted. The greatest number of medical students registered at any one time during the year was 139.

During the year the school furnished instruction to 298 students distributed as follows: medicine, 138; dentistry, 38; dental hygiene, 11; pharmacy, 31; liberal arts, 41; nurses, 39.

Graduates.—Of a total official faculty of 108, 25 were full time teachers and 83 part time. One principal appointment, that of professor and head of the department of surgery was made effective July 1, 1936. A full time professor and head of the department of medicine has been appointed effective July 1, 1937.

One General Education Board Fellow completed a year of post-graduate study of tuberculosis at the Henry Phipps Institute for Tuberculosis, University of Pennsylvania, and reported July 1, 1937, for duty as part time instructor in medicine (tuberculosis). One General Education Board Fellow has been appointed to study neuropsychiatry at the University of Iowa.

There have been 18 scientific publications by members of the faculty during the year. In addition, nine members contributed eight articles on The Health Status and Health Education of Negroes in the United States appearing in the Yearbook, No. VI of the Journal of Negro Education, July 1937.

Hospital facilities.—Since the value of clinical teaching must be conditioned by the type of care rendered to the patient, it is important that the Freedmen's Hospital, which we utilize for teaching purposes, shall be adequately provided with physical facilities, nursing service, social service, and clinical service; that the university make with the proper authorities, such arrangements as will guarantee to it unquestioned right to select the professional staff of the hospital, to establish and maintain appropriate standards of patient care and to select and control the clinical material for teaching purposes.

COLLEGE OF DENTISTRY

General trends.—The dean of the college reports that this is the best year of his administration. The slow but steady increase in enrollment continued. There was an increase also in the number of graduates. The clinic increased its work and its receipts by 14.5 percent, and "the second semester closed with more work accomplished by students and teachers than in any other one year of the present administration."

Enrollment.—The total enrollment in the college of dentistry continued gradually to increase. In 1933-34 there were 41 students; in 1934-35 there were 44; in 1935-36 there were 47 and in 1936-37 there were 49.

Oral hygiene.—The department of oral hygiene completed its third year of work. This unit is making satisfactory progress. During the current year 11 students enrolled.

Graduates.—At the commencement season 11 graduates were awarded the degree of doctor of dental surgery and 5 students in oral hygiene were awarded the certificate of graduation.

The clinic.—The total clinic income for the year was raised from \$5,657 to \$6,480, an increase of \$823 or 14½ percent. This increase of income is an index of the increased capacity of our students to do clinic work and of the better development of the clinic as a teaching unit and a useful health-serving agency for the community.

General university health project.—Since last October the college of dentistry has been cooperating with the department of physical education of Howard University in a general health project. Each student who takes the course in physical education (and this includes practically all freshmen in the college of liberal arts) is given a complete X-ray and clinical examination of the mouth, a report of which is forwarded to the department. The final grade in physical education is partially contingent upon the completion of the treatment indicated.

Physical plant improvement.—Much of the serious overtaking of services in the college of dentistry has been relieved by the provision of additional laboratory facilities on the ground floor, by the installation of additional laboratory benches, storage cabinets, and new hot water facilities, and by the painting of the main and ground floors. This work was done from the funds and under the supervision of the Public Works Administration. It has substantially improved the working facilities of the college of dentistry and greatly heightened the morale of the staff and the students.

Faculty.—There were 13 members of the faculty of dentistry during the year, 11 of whom were giving their full time to the work while 2 others were giving part time service equivalent to 1 full time teacher. These members were distributed as follows: Two associate profes-

sors, two assistant professors, six instructors, and one assistant. There was one major appointment. The work of improvement through further study encouragingly continued. One member returned from graduate study. Two members were on leave for further graduate work during the year while two other members of the staff have obtained leave of absence for further study during the coming year.

Needs.—The primary need of the college of dentistry is an increased number of able students. The present low enrollment is not an index of the state of need. Among the Negro population of the country the need for dental service is acute. While there is 1 dentist in the United States to every 1,700 members of the general population there is one Negro dentist to each 3,389 of the Negro population. In the States of the South the need is so great that in a State like Mississippi there is only 1 dentist for each 34,818 of the Negro population. (2) The faculty needs one additional full-time teacher. (3) The completion of the renovation begun, according to the original plan, involving (a) the installation of insects' screen, (b) minor structural changes on the main floor, (c) completion of renovation in basement. (4) The reequipping of the clinics throughout. This will involve the installation of units, chairs, and X-ray equipment.

COLLEGE OF PHARMACY

Curriculum.—The curriculum in pharmacy now in force is the new 4-year curriculum designed to meet the requirements of the American Association of Colleges of Pharmacy. The graduates of 1937 were the first to be awarded degrees on the basis of this new curriculum.

Registration.—Thirty-one students registered for all classes at the beginning of the past year. Fourteen were freshmen.

Graduates.—There were three graduates from the college of pharmacy who received the degree of bachelor of science in pharmacy.

Faculty.—The faculty for 1936-37 has been the same as for 1935-36, with two full professors, two instructors in pharmacy, full time, and one instructor, part time.

Equipment.—Scientific equipment of this college is quite adequate for the present and compares favorably with that of other small colleges. Improvements and additions will be needed in the near future, as the college develops and enrollment increases. Enlarged space in the library is greatly needed for students and teaching staff.

SCHOOL OF LAW

General trends.—The new location of the school of law on the main campus of the university has proved eminently satisfactory to teachers and students, and has been highly commended by the leaders in the profession.

Enrollment.—There were 72 students in the school of law during the school year 1936–37. This represents an increase of 10 or 12½ percent over the enrollment of 1935–36 and doubles the enrollment of 1933–34. These 72 students came from 38 colleges and universities in 21 States and 3 foreign countries. This represents an expansion of the base of supply by nine institutions and one State.

Enrollment again increased from 62 to 72. The sources of enrollment broadened their base from 23 to 24 States (21 States and 3 foreign countries) and from 29 to 38 colleges and universities. The high caliber of entering students continues to be impressive.

Of these 72 students 29 were new entrants. Thirty-one, or 71.4 percent of these 29 new entrants had done 4 or 5 years of college work.

The school of law is thus not only attracting an increasing number of new students, but is steadily widening the area of confidence among supplying institutions, and attracting their high calibered students.

Graduates.—Seventeen graduates received the degree of bachelor of laws in 1936–37 as compared with five in 1935–36. This is the largest graduating class since the establishment of the full-time day school of law.

Since the last annual report was submitted graduates of the Howard University school of law have successfully passed bar examinations and have been admitted to the practice of law in the following jurisdictions: District of Columbia, Michigan, New York, New Jersey, Oklahoma, Virginia, and West Virginia.

Faculty.—The faculty of the school of law is now composed of eight teachers, distributed in rank as follows: professors, two; associate professors, two; assistant professors, four; lecturers, one. Four of these teachers gave their full time to the work and four gave part time. One major appointment of the faculty was made during the year and one member of the staff resigned to accept the appointment of the President of the United States to a judicial position in the Virgin Islands.

The library.—The circulation during the year increased from 2,043 to 3,657. The total attendance for the year was 3,940 persons.

Number of volumes now in the library, 17,076; received on purchase, 1936–37, 323; as gifts, 1936–37, 535; added as bound periodicals, 1936–37, 90; periodicals received on purchase, 1936–37, 34; as gifts, 1936–37, 16.

Outlook and needs.—When the 3-year full-time day school of law was first established, it was clearly an experiment. From the point of view of number of students, caliber of students, and wide confidence of supporting institutions, the experiment is a success and has a hopeful future. The work done by the school is clearly an urgent necessity for the colored people of the United States are heavily undermanned in legal leadership. While they constitute an approxi-

mate tenth of the population they have only 1,250 out of 160,000 members of the legal profession—less than 1 percent. A first-class law school serving this needy tenth of the population is manifestly a great national service. The major needs at present are money for an addition full-time teacher, funds for books, and for scholarships for gifted, needy students.

SCHOOL OF RELIGION

Financial support.—The school of religion receives no support from Federal funds. Its work is maintained wholly by income from endowment and gifts from private sources.

General trends.—During 1936-37 the school of religion completed the transition to an entirely graduate basis. This year's enrollment was entirely graduate in character and the numbers were decisively encouraging. Work was also established leading to the degree of master of arts in the graduate school. The library collection increased from 1,443 to 2,100 volumes.

Enrollment.—In the first semester of the year 1936-37, 26 students were enrolled in the school of religion. During the second semester there were 22 students.

Graduates.—Nine students were graduates from the school of religion on commencement day. Seven received the degree of bachelor of divinity and two received from the graduate school the degree of master of arts in religious education.

The faculty.—The faculty of the school of religion for the current year consisted of nine members, two of whom were giving their full time to the work and seven were giving part-time service equivalent to the full-time service of four, making a full-time equivalent teaching staff of six persons. This staff was distributed as follows: professors, three; instructors, five; lecturer, one. Two members of the staff returned from service in India where they went as representatives of national religious organizations. Members of this staff published two books and three scholarly articles during the year.

Outlook and needs.—When 4 years ago the trustees undertook to establish the interdenominational school of religion on a purely graduate basis, the project was clearly an experiment. From the point of view of students it now appears that the experiment will surely succeed. The outstanding needs of the school are now 3: (1) funds to provide 4 additional full-time teachers, (2) funds to provide a substantial increase in the number of books available in the library, and (3) funds to provide an adequate and attractive building. The present wooden structure is both inadequate and unattractive. Toward this project the university now has \$18,000, which came as gift from John A. Cole, an honorary member of the board of trustees. Mrs Franklin D. Roosevelt made an additional contribution during the current year.

THE LIBRARY

The new building.—The outstanding event of the year was the beginning of construction of the new founders library, for which \$1,105,000 of Public Works Administration funds was appropriated by the President of the United States in November.

Moorland Foundation.—The total number of items in the collection now totals 10,354, which includes 6,119 books, 3,654 pamphlets, 382 bound periodicals, 199 masters' theses. The rate of purchase and gifts has slowed considerably. Whereas 1,021 items relating to the Negro were purchased in 1935-36, only 139 books and pamphlets were purchased in 1936-37.

Accessions and cataloging.—New accessions for the year total 2,851 purchased books, 1,406 gift books, and 696 new bound periodicals, or a total of 4,953 accessions. There were cataloged 2,911 titles, or 3,872 books. The cataloging of all bound periodicals in the main library has begun with 43 titles, or 723 volumes completed.

Veterans' Bureau books.—From this collection 1,846 books were distributed. After distributing for 10 years, more than 140,000 books, or about 85 percent of the original number received, this service feature has been discontinued.

Size and circulation.—The number of books now accessioned in the libraries of the university totals 106,360. Of these 10,775 are in the school of medicine, 19,478 in the school of law, 2,143 in the school of religion. During 1936-37 a total of 5,901 books was accessioned, a total of 769 periodical titles received, and a total circulation of 114,446 recorded.

Immediate needs.—The immediate needs of the library are (1) \$300,000 to secure books and periodicals, to purchase the available collections of books on Negro life for the Moorland Foundation, (2) an enlarged staff to care for the work in the new building, and (3) professional classification and salary scale for the staff.

BUILDINGS AND GROUNDS

Buildings under construction.—The following table shows the list of building projects in process during the year ended June 30, 1937. These buildings were going forward under the funds and direction of the Federal Emergency Administration of Public Works.

Building Projects in Process, Year Ending June 30, 1937

No.	Description of project	Date authorized	Total appropriations
2	Construction and equipment of a chemistry building.....	May 4, 1939	\$626,300.00
5	Construction and equipment of a library building.....	Feb. 14, 1931	1,105,000.00
8	Construction and equipment of a heat, light, and power plant.....	Feb. 17, 1933	555,576.99
9	Construction and equipment of dormitories for men.....	Oct. 4, 1935	525,000.00

The status of the above listed projects as at June 30, 1937, was as follows: Project No. 2—chemistry building. Building completed. Presented to the university by the Secretary of the Interior and dedicated by the President of the United States in October, 1936. Building in use throughout the school year 1936–37.

Project No. 5.—Construction and equipment of a library building—President of the United States set aside an additional appropriation of \$305,000 for this project, in November 1936. Contract was let and work had progressed above the first floor. Cornerstone was laid in June by the Honorable Oscar L. Chapman, Assistant Secretary of the Interior and Senator Robert La Follette.

Project No. 8.—Construction and equipment of a heat, light, and power plant—project completed—test practically completed. Certain minor adjustments were being made prior to the final acceptance of the project by the Federal Government.

Project No. 9.—Construction and equipment of dormitories for men. First bid proposals received. Completed plans and specifications rejected by the Secretary of the Interior on account of the abnormally excessive cubic foot cost. Preparation is being made for the advertising for new bid proposals with the expectation that wider competition will produce estimates within the appropriation.

FINANCES

Assets.—The total assets of the university at June 30, 1937, were \$8,262,481.45, exclusive of the unexpended balances of government appropriations for the chemistry building, the heat, light, and power plant, the library and the men's dormitories. Of the total assets \$1,095,881.24 represents assets in the physical plant extension fund, made possible through private gifts from the General Education Board and the Julius Rosenwald Fund; \$959,593.54 represents endowment (an increase of \$49,581.18 over the previous year); \$5,978,237.08 represents plant fund assets (an increase of \$197,653.49 since the last report) exclusive of the unexpended balances of government expenditures for buildings, as indicated above. The remaining \$228,769.59 represents assets of the current fund.

Income and expenditures.—The total income for the year 1936–37 was \$1,427,441.31, including current and capital funds. This represents a gross decrease of \$265,274.95 under the total income for 1935–36. The total income for current purposes, however, was \$1,115,351.34, or an increase of \$91,232.74 over the income for current purposes for 1935–36. There was an increase of 6.3 percent in the income from private sources and a corresponding decrease of 6.3 percent in the proportion of income from government sources.

The total expenditures for all purposes, current and capital were \$1,411,240.86, representing a gross decrease of \$281,475.40 under the

total expenditures for 1935-36. The total current expenditures for 1936-37 were \$1,099,150.89, representing an increase of \$73,667.39 over the current expenditures for 1936-37.

Balanced budget.—The budget was kept at balance and there was an excess of income in the amount of \$16,200.45 available toward the retirement of the accumulated deficit.

Audit and supervision.—The auditing of all the university's accounts has been done by certified public accountants. All moneys appropriated by the Congress and by the Public Works Administration were expended under the supervision of the Secretary of the Interior.

FREEDMEN'S HOSPITAL

Dr. T. Edward Jones, *Surgeon in Chief*

IN submitting his first annual report, representing, however, but 7 months of his official incumbency, the surgeon in chief pays a high tribute to his predecessor, Dr. William A. Warfield, who held the position for more than 35 years.

The statistical data for the year shows that there were 5,587 indoor patients under treatment, an increase of 524 over the previous year. Of these 880 were private or pay patients, 2,705 were District of Columbia indigents, and 2,003 were United States indigents. Of the total number under care 329 died. The remainder were discharged either as cured or improved to the extent that hospitalization was no longer necessary. Eight hundred and twenty-eight babies were born in Freedmen's Hospital. One thousand eight hundred and thirty-five major operations were performed. Eight thousand three hundred and thirty-three emergencies were treated. One thousand three hundred and forty-one ambulance calls were made. Thirty-six thousand, and fifteen visits were made to the outdoor clinics.

PERSONNEL NEEDS

The most urgent need is an increase in the nursing personnel. At many periods throughout the day 1 nurse is compelled to care for 24 patients, whereas it is a requirement by the District Board of Nursing that under normal circumstances 1 nurse should be assigned to every 4 patients, and the tours of duty should be only 8 hours. Because of this shortage of nurses the hospital admissions have been reduced in order to give the patients a semblance of care approaching efficiency.

An increase in the clerical force is recommended as absolutely necessary if proper hospital records are to be kept and the administration of the hospital efficiently maintained.

The handicap of the social-service department grows more acute as additional demands are daily being made, and two additional social-service workers are needed if this department is to continue its function

efficiently, providing social case study and furthering the professional treatment on an individual basis.

The housekeeping and dietary departments are woefully undermanned. Six additional orderlies and six additional maids are required if the hospital is to be kept in a proper state of cleanliness.

In the dietary department, because of a shortage of cooks, it frequently happens that a dishwasher has to assume the duties of a cook. Four additional cooks, two utility men, and two dishwashers are needed.

With the present force of ambulance drivers, it is not infrequently that a driver is required to work 12 hours per day, if the ambulance is to respond to calls received. An additional driver is requested. The same long hours apply to the telephone operators, if the service is to be covered without the present use of orderlies and maids who have only a limited experience with telephone requirements. As a result of their inexperience innumerable complaints are received from the public, to say nothing of the retardation of the efficient handling of official business.

The demands made upon the drug department have more than doubled since the present space and personnel were originally set up. This means that additional space must be provided and two assistant pharmacists added in an effort to cope with the ever-increasing requirements.

PHYSICAL ASPECTS

Attention is directed to the physical needs of the hospital which are inadequate in every phase. All painted areas are sadly in need of repainting. Roofs are leaking in many spots, some of which are directly over the patients' beds. These beds are evacuated in the presence of heavy rains. It is further set forth in the report that the plumbing, some of which is more than 30 years old, offers a distinct hazard. Any day major defects may assume such proportions that hospital activities will have to suspend.

Repairs to roadways are most forcibly recommended.

COLUMBIA INSTITUTION FOR THE DEAF

Percival Hall, *President*

DURING the fiscal year there were under instruction in the advanced department of the institution, known as Gallaudet College, 87 men and 54 women, a total of 141, representing 38 States and Canada. This is a decrease of four as compared with the preceding year. In the primary and grammar department, known as the Kendall School, there were under instruction 38 boys and 36 girls, a total of 74. This is an increase of five as compared with the preceding year. Of the total in this department 69 were admitted as beneficiaries of the District of Columbia. There were admitted to the institution 42 males and 28 females; discharged 35 males and 18 females.

The courses of instruction were practically the same as in the past year with the addition of a course in the principles of teaching for the seniors.

There has been practically no advance made in the building program, which calls first for a memorial building to Edward Miner Gallaudet, to house library, printing office, new laboratories, recitation rooms, etc. There are needed besides extensions to old laboratory building, present gymnasium, and new units for housing pupils of the primary department as well as an additional cottage for use of an instructor. No additional buildings have been provided for the institution since 1918, though in the meantime the number of students and pupils has increased 25 percent. Better fire protection should be provided by laying of larger water main and installation of modern fire hydrants.

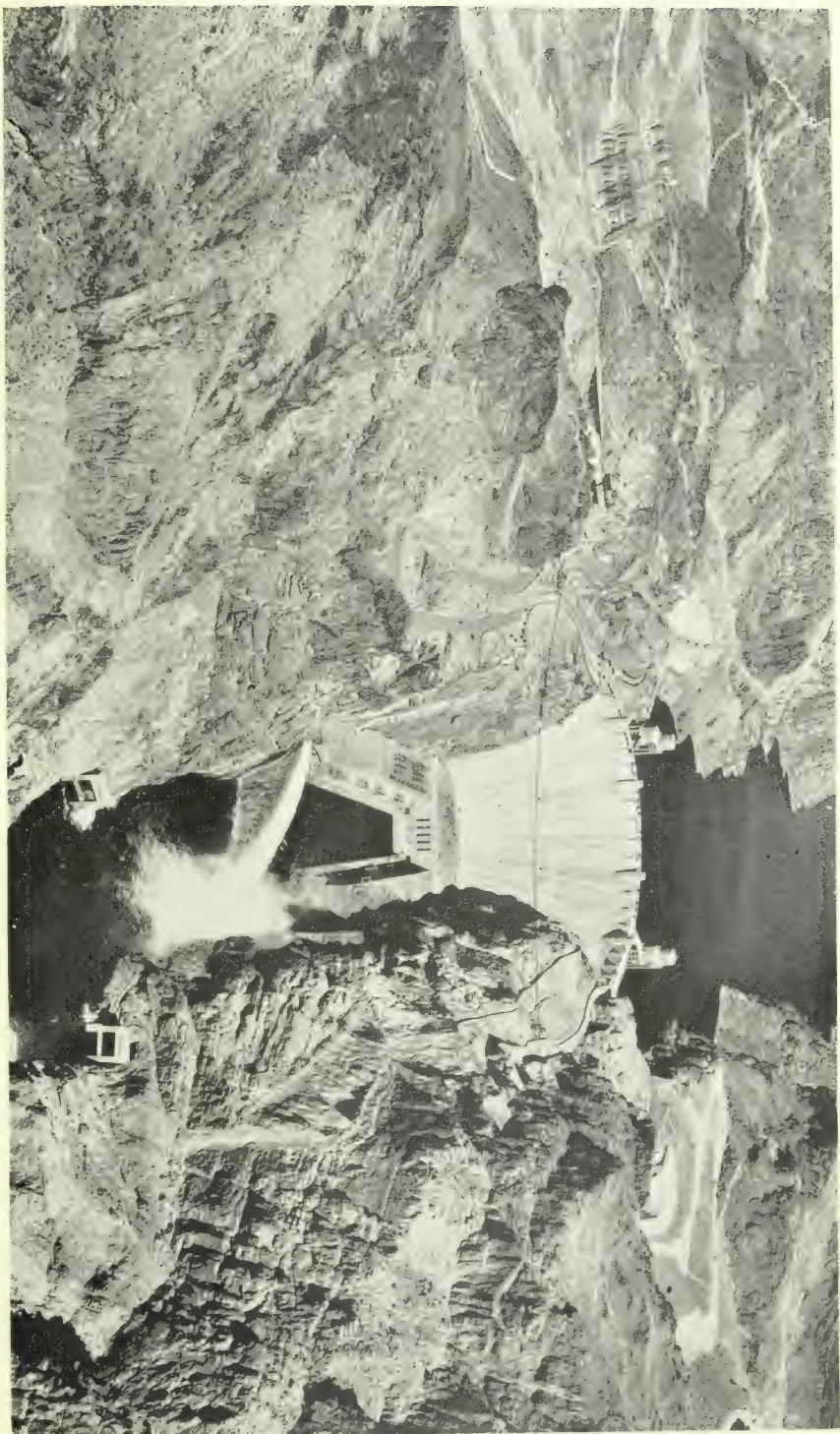
An interesting problem on the most exact method of communication between teacher and pupil is being studied at our institution with funds provided by the National Research Council. There are other problems that should be carried on for the benefit of the education of deaf pupils throughout the country, and a provision should be made for a permanent research worker.

A regular meeting of the Convention of American Instructors of the Deaf was held at New York under the auspices of Columbia University and was attended by a number of members of our faculty who took part in the program. A special meeting of the Conference of Executives of American Schools for the Deaf was also held at the same time, and the president of the institution laid before this meeting recommendations for work along lines of improving the education of the deaf.

The total receipts, including balance on hand July 1, 1936, were \$176,691. Expenses were \$174,196. A reserve of \$502 was returned to the treasury, leaving a balance of \$1,993. The invested funds of the institution in the hands of the treasurer total in value approximately \$85,000.

On presentation day, June 5, six degrees of master of arts in the normal department were granted, nine degrees of bachelor of arts in course, and five degrees of bachelor of science in course were conferred. The honorary degree of master of arts was conferred on three former graduates of Gallaudet College who are now well known educators of the deaf, namely, Henry J. Stegemerten, principal, School for the Colored Deaf and Blind, Overlea, Md.; Odie W. Underhill, instructor, School for the Deaf, Morganton, N. C.; and Nathan Zimble, principal, School for the Deaf, Little Rock, Ark.





A VIEW OF BOULDER DAM.



